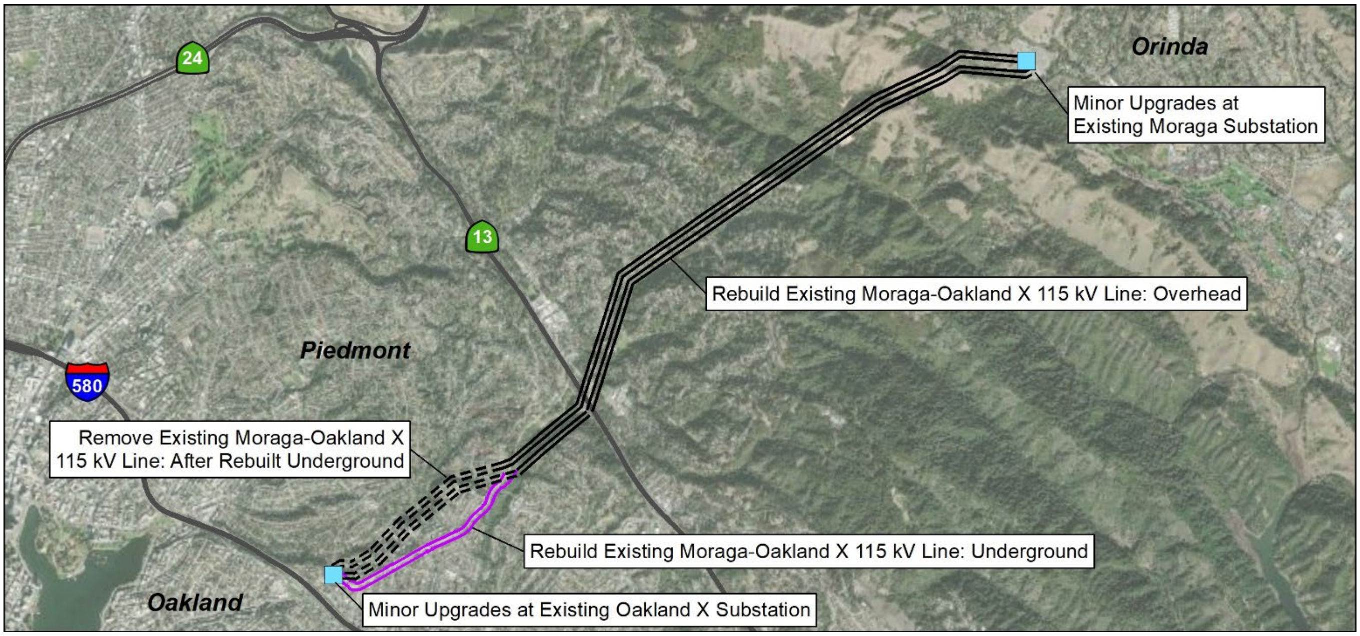

Proponent's Environmental Assessment for Pacific Gas and Electric Company's Moraga–Oakland X 115 kV Rebuild Project

November 15, 2024

Pacific Gas and Electric Company (PG&E) is proposing to rebuild approximately 5 miles of four overhead 115 kilovolt (kV) power lines between Moraga and Oakland X substations. Work would include approximately 4 miles of overhead rebuild within the existing alignment as two double-circuit 115 kV power lines and approximately 1 mile would be undergrounded in city streets in two double-circuit duct banks. Minor upgrades would be required at the existing Moraga and Oakland X substations.

The project would be located within the unincorporated areas of Contra Costa County and the cities of Orinda, Oakland, and Piedmont, California.

Application A.24-11-XX to the California Public Utilities Commission

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Provided in a separate section after Chapter 9 and prior to the Appendices.

Figure 5.1-16b. Visual Simulation - Hollywood Avenue
Figure 5.1-17a. Existing View - Holman Road

Acronyms and Abbreviations

°F	degree(s) Fahrenheit
AAC	All-aluminum conductor
AADT	Annual average daily traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC Transit	Alameda-Contra Costa Transit District
ACCDA	Alameda County Community Development Agency
ACDEH	Alameda County Department of Environmental Health
ACE	Areas of Conservation Emphasis
ADA	Americans with Disabilities Act
ADU	accessory dwelling unit
AF	acre-feet
AIA	airport influence area
AMM	avoidance and minimization measure
amp	ampere(s)
amsl	above mean sea level
ANSI	American National Standards Institute
API	area of potential impact
APM	Applicant-Proposed Measure
APN	assessor parcel number
AQMP	air quality management plan
ATCM	airborne toxic control measures
AWS	Alameda whipsnake
B.P.	before present
BAAQMD	Bay Area Air Quality Management District
BAHCP	Bay Area Operations and Maintenance Habitat Conservation Plan
BART	Bay Area Rapid Transit
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMP	best management practice

BSA	biological study area
CA HSC	California Health and Safety Code
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Cal IPC	California Invasive Plant Council
CalOSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCH	Consortium of California Herbaria
CCR	California Code of Regulations
CCRD	Confidential Cultural Resource Database
CCTS	Central California Taxonomic System
CDF	California Department of Finance
CDFW	California Department of Fish and Wildlife
CE	conservation easement
CEC	California Energy Commission
CEHC	California Essential Habitat Connectivity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	CDFW Fish and Game Code
CFR	Code of Federal Regulations
CGS	California Geological Survey
CLN	Conservation Lands Network
CNDDB	California Natural Diversity Database
CNEL	Community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide

CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COPD	City of Orinda Police Department
CPS	Cleanup Program Site
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CRPR	California Rare Plant Rank
CRS	Cultural Resource Specialist
CTS	California tiger salamander
CWA	Clean Water Act
dB	decibel(s)
dBA	A-weighted decibel(s)
dbh	diameter at breast height
DMR	California Division of Mine Reclamation
DOC	California Department of Conservation
DPM	diesel particulate matter
DPR	California Department of Parks and Recreation
DPS	Distinct Population Segment
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EDR	Environmental Data Resources, Inc.
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
EPSS	Enhanced Powerline Safety Settings
ESL	environmental screening level
FAA	Federal Aviation Administration
FEIR	Final Environmental Impact Report

FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	federal Endangered Species Act
FHSZ	fire hazard severity zone
FHWA	Federal Highway Administration
FIA	fire index area
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping & Monitoring Program
FPI	Fire Potential Index
FRA	federal responsibility area
FS	Environmental Field Specialist
FTA	Federal Transit Administration
FTC	Flowable thermal concrete
FYLF	foothill yellow-legged frog
GC	Government Code
GHG	greenhouse gas
GO	General Order
gpm	gallon(s) per minute
GPS	global positioning system
GSA	General Services Agency
GSP	Groundwater Sustainability Plan
GWh	gigawatt hour(s)
HAP	hazardous air pollutant
HCP	Habitat Conservation Plan
HDPE	high-density polyethylene
HFTD	hire fire threat district
HHRL	human health risk level
HHZ	high-hazard zone
HMBP	Hazardous Materials Business Plan
hp	horsepower
HWCL	Hazardous Waste Control Law
HWD	Hayward Executive Airport

I	Interstate
ITP	Incidental Take Permit
KOP	Key Observation Point
kV	kilovolt(s)
lbs	pound(s)
LDSP	light-duty steel pole
L_{dn}	day-night sound level
L_{eq}	equivalent sound pressure level
LOS	Level of service
LQG	large quantity generator
LRA	local responsibility area
LSP	lattice steel pole
LST	lattice steel tower
LT	Long-Term
LUST	leaking underground storage tank
LZ	Landing Zone
MBTA	Migratory Bird Treaty Act
MBZ	Map Book zone
MCSP	Moraga Canyon Specific Plan
MCV	Manual of California Vegetation
MGCC	minimum ground conductor clearance
mgd	million gallon(s) per day
MLD	Most Likely Descendant
MOFPD	Moraga-Orinda Fire Protection District
mph	mile(s) per hour
MRRT	Montclair Railroad Trail
MRZ	Mineral Resource Zone
MT	metric ton(s)
MTC	Metropolitan Transportation Commission
MW	megawatt(s)
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission

NCCP	Natural Community Conservation Planning
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWCG	National Wildfire Coordinating Group
O_3	ozone
O&M	operations and maintenance
OAK	Oakland International Airport
OEIS	California Office of Energy Infrastructure Safety
OFD	Oakland Fire Department
OPD	Oakland Police Department
OPGW	Optical ground wire
OSCAR	Open Space, Conservation, and Recreation
OUSD	Oakland Unified School District
PCE	tetrachloroethene
PEA	Proponent's Environmental Assessment
PERP	Portable Equipment Registration Program
PFD	Piedmont Fire Department
PG&E	Pacific Gas and Electric Company
$PM_{2.5}$	particulate matter less than 2.5 micrometers in aerodynamic diameter
PM_{10}	particulate matter less than 10 micrometers in aerodynamic diameter
PPD	Piedmont Police Department
ppm	parts per million
PPV	peak particle velocity

PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
PTC	Permit to Construct
PV	photovoltaic
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
ROG	reactive organic gases
ROW	right-of-way
RWQCB	Regional Water Quality Control Boards
SBI	Swaim Biological Inc.
SCADA	Supervisory control and data acquisition
SCAQMD	South Coast Air Quality Management District
SDS	Safety Data Sheet
SF_6	sodium hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFHA	special flood hazard area
SIP	state implementation plan
SLF	Sacred Lands File
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SQG	small quantity generator
SR	state route
SRA	state responsibility area
SSC	Species of Special Concern
ST	Short-Term
SW	static ground wire
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TAZ	Transportation Analysis Zone
TCR	Tribal Cultural Resource

TMDL	total maximum daily load
TMP	Traffic Management Plan
TPP	transmission planning process
TSP	tubular steel pole
UBC	Uniform Building Code
UFC	Uniform Fire Code
USA	Underground Service Alert
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UWMP	Urban Water Management Plan
V	volt(s)
VMT	Vehicle miles traveled
VRP	Vegetation Restoration Plan
WBWG	Western Bat Working Group
WL	Watch List
WMP	Wildfire Mitigation Plan
WRCC	Western Regional Climate Center
WSAB	California Wildfire Safety Advisory Board
WTRM	Wildfire Transmission Risk Model
WUI	Wildland Urban Interface
XLPE	cross-linked polyethylene

1. Executive Summary

In accordance with the California Public Utilities Commission (CPUC) General Order (GO) 131-D, this Proponent's Environmental Assessment (PEA) has been prepared by Pacific Gas and Electric Company (PG&E) to support the application for a Permit to Construct for the Moraga-Oakland X 115 kilovolt (kV) Rebuild Project (project).

1.1 Proposed Project Summary

The project will rebuild four overhead 115 kV power line circuits that span an approximately 5-mile length between PG&E Moraga and Oakland X substations. The two existing parallel double-circuit lines will be rebuilt as hybrid power lines, meaning the two double-circuit lines between the two substations will have both overhead and underground portions. Existing towers, poles and conductors will be replaced either with overhead rebuild or underground components, and minor modifications will occur within the existing substations. Some recently replaced power line structures will be reused or reused with some modification. Single-circuit transition structures will support the connection between the overhead and underground portions of each circuit. Double-circuit transition structures will be used to connect the underground portion to existing overhead circuit terminals at Oakland X Substation. Additionally, the rebuild will include the installation of a static ground wire (SW) and an optical ground wire (OPGW)[1] connecting to each aboveground structures with grounding and a telecommunication cable continuing within the underground portion.

The project will be located within a portion of unincorporated Contra Costa County, and the cities of Orinda, Oakland, and Piedmont (refer to Figure 3.1-1[2]). The existing land uses in this project include utility in the city of Orinda, open space and parks in unincorporated Contra Costa County, and residential, commercial, parks, places of worship and schools within the cities of Oakland and Piedmont.

The purpose of the project is to replace power line equipment that has reached the end of its useful life. This maintenance is needed for safe operation of the lines. The objectives of the project are to rebuild the four circuit power line path with new equipment including replacing the existing conductor with a larger size to accommodate future energy demands, to ensure the lines are rebuilt with adequate line clearances between the ground or land use, and to construct a safe, economical, and technically feasible project that minimizes environmental and community impacts.

1.2 Land Ownership and Right-of-Way Requirements

Project components include existing facilities within the existing PG&E land ownership, rights-of-way (ROW) and easements, some of which may be modified to accommodate rebuild power line segments. Project work at PG&E's Moraga and Oakland X substations will occur within the existing substation

[1] A static ground wire (SW) and an optical ground wire (OPGW) are strung above a high-voltage power line on the top set of structure arms (refer to Figure 3.3-2c). The SW will be located on one arm and the OPGW will be located on the opposite arm. The SW and the OPGW can both intercept electricity from a lightning strike before it reaches the high-voltage electrical equipment. The ground wires are designed to be the path of least resistance and the electricity follows the wire to the ground (soil). Soil has a negative charge that safely dissipates the positive charge of the electricity. Like a lightning rod, this ground wire method attracts the electricity from a lightning strike to avoid or minimize damage to the high-voltage electrical equipment on the structure. The SW is made of steel alloys that only carry an electrical current when struck by lightning. The OPGW has optical fibers in the center of the steel that communicate data through the wire while also providing grounding protection with the exterior steel. Refer to Figures 3.3-6 and 3.3-7 for underground grounding and telecommunication.

[2] All figures not inserted into text are in the PEA after Chapter 9, References, and before the PEA Appendices.

properties, which are owned in fee by PG&E. The underground portion of the project will be located on PG&E property owned in fee, franchise rights in city streets and one new easement from the City of Oakland. PG&E will establish temporary construction easements or seek encroachment permits or easements for construction project components.

Land rights issues are not part of this regulatory proceeding in which the CPUC is considering whether to grant or deny PG&E's application for a Permit to Construct (PTC) to upgrade existing electrical facilities. Rather, any land rights issues will be resolved in subsequent negotiations and/or condemnation proceedings in the proper jurisdiction, following the decision by the CPUC on PG&E's application (for example, refer to the Jefferson-Martin 230 kV Transmission Project, A.02-04-043, D.04-08-046, p. 85).

A list of parcels within 1,000 feet of the project and the retained alternatives was developed from county assessor office parcel data. Refer to Appendix 1A for a list of Assessor's Parcel Number, physical address, and mailing address on record. A list of mailing addresses associated with PG&E electric service meters within 1,000 feet of the project and the retained alternatives was developed. Refer to Appendix 1B for mailing addresses.

1.3 Areas of Controversy

There are no known areas of controversy, and no major issues that must be resolved related to the project. PG&E considered public input and preferences during project development. Early community comments indicated a preference to underground all replaced power lines. Undergrounding comments received during the 2024 open houses generally revolved around support for the rebuild route option to underground within Park Boulevard. The proposed project and alternatives described in Chapter 4 incorporate undergrounding a portion of the power lines as well replacing the existing equipment with new equipment to significantly reduce existing modeled wildfire risk.

1.4 Summary of Impacts

Project impacts are primarily construction-related and the project has been planned and engineered to avoid or minimize the largely temporary environmental impacts. Based on the analysis presented in Chapter 5, Environmental Analysis, the project is not expected to result in significant and unavoidable impacts. Applicant-Proposed Measures (APMs) will be implemented to further avoid or minimize impacts on environmental resources, ensuring that any remaining impacts will be less than significant. These APMs are identified in the respective resource sections within Chapter 5 and are summarized in Chapter 3, Project Description, Table 3.11-1.

1.5 Summary of Alternatives

PG&E screened the potential alternatives based on three criteria: (1) does the alternative meet most basic project objectives, (2) is the alternative feasible, and (3) does the alternative avoid or substantially lessen any significant environmental effects of the proposed project (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the proposed project). As a first step in developing some of the alternatives, PG&E considered possible power line route segments or alternatives outside of the existing alignment for each of the three main geographic project sections – eastern, central, and western – and combined these sections with each other or with sections of the project to create complete alternatives. PG&E also considered alternatives proposed to the California Independent System Operator (CAISO), alternatives suggested during stakeholder outreach, replacement locations outside the ROW, aboveground and underground alternatives, distributed energy resources, and energy storage.

In addition to the No Project Alternative, PG&E identified eight alternatives for consideration. This list represents a reasonable range of alternative locations and configurations. However, nearly all the alternatives identified did not meet some project objectives and most had significant technical and economic feasibility issues as well as greater impacts to some environmental resources. Two of the alternatives had been shared with stakeholders. PG&E compared the alternatives with the project purpose, project objectives, feasibility criterion (consideration of schedule, economic, environmental, legal, social, and technological factors), and environmental criterion (reduction of potentially significant environmental impacts).

The alternatives carried forward for PEA evaluation include the following:

- Alternative A, Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground, which would replace three of the four existing Moraga–Oakland X circuits on two sets of structures in an overhead configuration; underground a portion of two circuits mainly in Park Boulevard and also in other roads; and underground a portion of the third circuit mainly in Monterey Boulevard, Lincoln Avenue and MacArthur Boulevard and also in other roads. Additionally, the sections on the Moraga–Claremont power lines would be reconductored, which would likely require replacement of existing structures.
- Alternative B, Manzanita Drive-Colton Boulevard-Estates Drive Underground, which would replace the existing Moraga–Oakland X 115 kV lines by replacing four overhead circuits on two sets of structures in an overhead configuration in the existing ROW in the eastern section; place the power lines underground in two double-circuit duct banks in the central section in Manzanita Drive, Colton Boulevard, and Mountain Boulevard with a transition station at the west end; transition to overhead power lines to cross over SR 13 and the Hayward Fault; and transition to two double-circuit duct banks mainly in Sims Drive, Somerset Road, Park Boulevard and other roads to Oakland X Substation.
- Alternative C, Shepherd Canyon Road Underground, which would replace the existing Moraga–Oakland X 115 kV lines by replacing four overhead circuits in the existing ROW in the eastern section; place the circuits underground in two double-circuit duct banks in the central section in Saroni Drive and Shepherd Canyon Road; transition to overhead near the City of Oakland Municipal Service Yard in a transition station before connecting overhead in the existing ROW to cross SR 13 and the Hayward Fault; continue overhead in the existing ROW to the transition underground in two double-circuit duct banks mainly in Park Boulevard and other roads to Oakland X Substation.
- Alternative E, Proposed Project with Campground Overhead Option, which would be the same as the proposed project except for two structures that would be placed approximately 325 feet northwest of the existing locations near the Eastport Staging Area entrance of the East Bay Regional Park District (EBRPD) Sibley Volcanic Regional Preserve.

The alternatives rejected include the following:

- Alternative D, All Overhead Rebuild in Existing Alignment, which would replace the power lines overhead in the existing ROW for the full length of the existing alignment.
- Alternative F, Conceptual South Overhead Alignment, which would include constructing two new double-circuit lines, primarily overhead in a new ROW from Moraga Substation through open space owned by East Bay Municipal Utility District (Indian Valley Preserve Conservation Easement), EBRPD (Reinhardt Redwood Regional Park), and the City of Oakland (Joaquin Miller Park); remain overhead to cross SR 13 and the Hayward Fault; and transition to underground in Lincoln Avenue, MacArthur Boulevard, and other roads to Oakland X Substation.
- Alternative G, Distributed Energy Resources, which would implement improvements to reduce electrical system demand through distributed energy generation and energy storage to the degree that the Moraga–Oakland X path is not needed.
- Alternative H, Energy Storage, which would implement improvements to provide sufficient energy storage in the project area that the Moraga–Oakland X path would not be needed.

1.6 Pre-filing Consultation and Public Outreach Summary

Pre-filing consultation and public outreach has occurred with CPUC, public agencies with jurisdiction over the project area, Native American tribes affiliated with the project area, other utility owners and operators, and the local community and public. Information received from the public and interested parties supported the development and refinement of power line routes. The importance of early project completion, timely construction noticing, and vegetation aesthetics were shared by the community with PG&E during the open houses in 2024.

Routing alternatives within Chapter 4 reflect undergrounding route options, alternatives with underground portions, and EBRPD's interest in relocating a set of structures away from a planned campground. The project schedule reflects the community interest in completing the project as soon as feasible. The project includes measures to provide timely construction noticing and complete site restoration including vegetation replacement where compatible with the lines.

1.7 Conclusions

This PEA describes the project and its alternatives and evaluates potential environmental impacts that could result from construction or operation and maintenance of the project. APMs will be implemented to further avoid or minimize potential less-than-significant impacts on environmental resources.

1.8 Remaining Issues

There are no known major issues that remain to be resolved related to the project.

2. Introduction

This chapter introduces background information for the Moraga–Oakland X 115 kilovolt (kV) Rebuild Project (project), including the project purpose and need, project objectives, and project applicant. Following the project background is a description of the project's pre-filing consultation and public outreach. This chapter concludes with an explanation of the expected environmental review process and a summarized list of the document's contents and organization.

2.1 Purpose and Need

This maintenance project will provide lifecycle updates of structures, address 2010 North American Electric Reliability Council (NERC) recommendations (R-2010-10-07-01) to industry and California Public Utilities Commission (CPUC) General Order (GO) 95 requirements by rebuilding the Moraga–Oakland X path, and reconductor existing project power lines to accommodate the future energy needs in the north Oakland area. Circuits 1 and 2 were installed circa 1908, and Circuits 3 and 4 were installed circa 1931. The entire path requires replacement for safe operation of the power lines. Inspections found corrosion of some of the steel structures and instances of inadequate ground to conductor clearances that have been corrected through maintenance activities in recent years. The project is intended to replace power line equipment on the path that has reached the end of its useful life and ensure ongoing adequate line clearances between the ground or land use once replaced.

The north Oakland area is supplied with electric power via a 115 kV system from Moraga and Sobrante substations. The four Moraga–Oakland X 115 kV Lines are one of the 115 kV paths that deliver power into the north Oakland area. The path is part of a local 115 kV system that delivers power to six PG&E substations with distribution facilities in the north Oakland area (Claremont K, Oakland D, Oakland L, Oakland C, Oakland X and Oakland J substations). Customers in the cities of Oakland, Piedmont, Berkeley, Emeryville, Alameda, unincorporated Contra Costa County, as well as the Port of Oakland municipal electric utility, the Schnitzer Steel plant, and the City of Alameda's Cartwright Substation, are served by the six distribution substations. Exhibit 2-1 shows a diagram of the electric transmission system serving Oakland and the East Bay Area. Exhibit 2-2 shows a map, for illustration purposes only, of the approximate areas served by the six distribution substations in Oakland, Piedmont, Berkeley, Emeryville, Alameda, and unincorporated Contra Costa County.

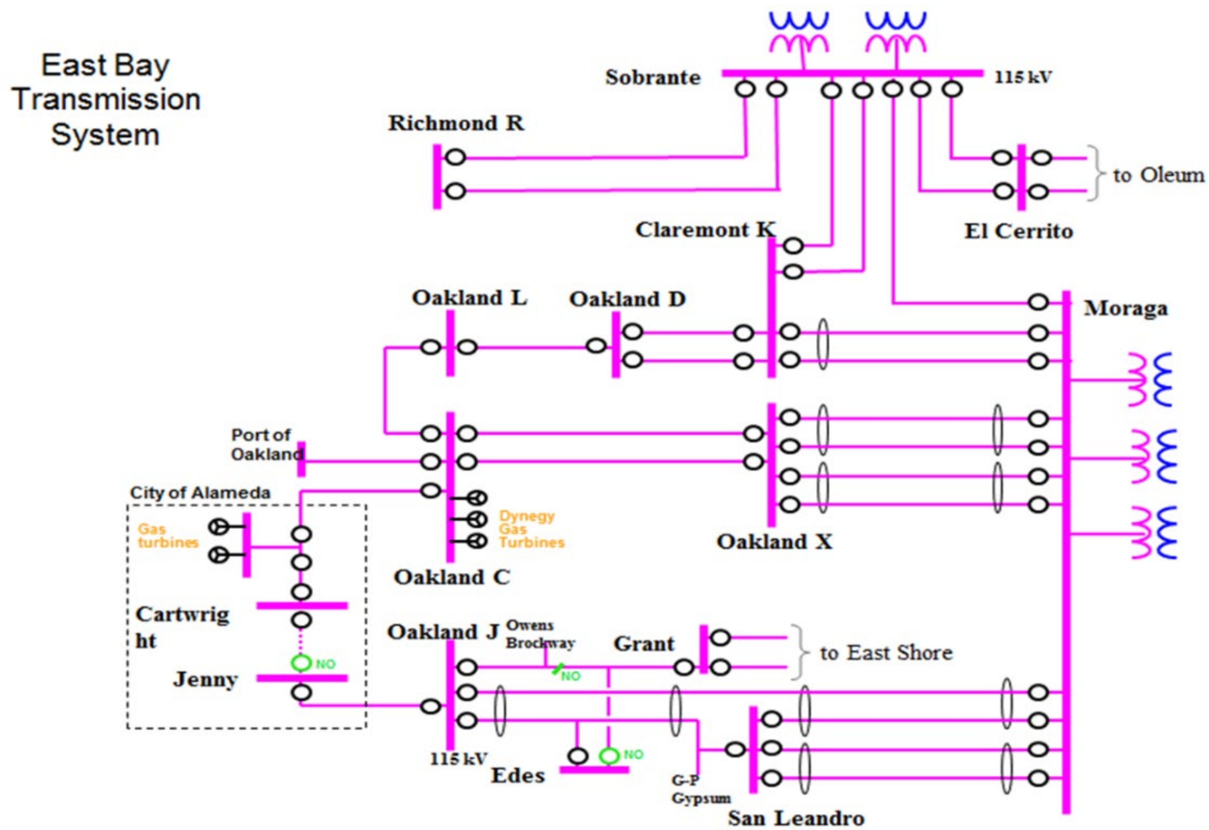
2.1.1 California Independent System Operator Consideration of the Project

The electricity industry includes utilities, private power plant owners, and state and federal agencies, each playing a distinct role. CAISO, a nonprofit public-benefit corporation, is charged with ensuring the safe and reliable transportation of electricity on the power grid serving 80 percent of California and a small part of Nevada. As the impartial grid operator, CAISO does not have financial interest in any individual segment, ensuring fair and transparent access to the transmission network and market transactions. The CAISO conducts an annual transmission planning process (TPP) that uses engineering tools to identify grid modifications necessary to maintain reliability, lower costs, or meet future infrastructure needs based on public policies. CAISO engineers design, run, and analyze complex formulas and models that simulate grid use under wide-ranging scenarios, such as high-demand days coupled with wildfires. The CAISO TPP includes evaluating proposals submitted for study into the interconnection queue to determine viability and impact to the grid (CAISO 2023).

The proposed project is one of the project scopes within the Northern Oakland Area Reinforcement that PG&E submitted as part of CAISO's 2019-2020 TPP in September 2019. Each of the project scopes have independent utility to address reinforcement findings in the area. PG&E's submittal addressed findings in the 2019-2020 Reliability Assessment Project (CAISO 2020). The proposed Northern Oakland Area Reinforcement project scopes included the following:

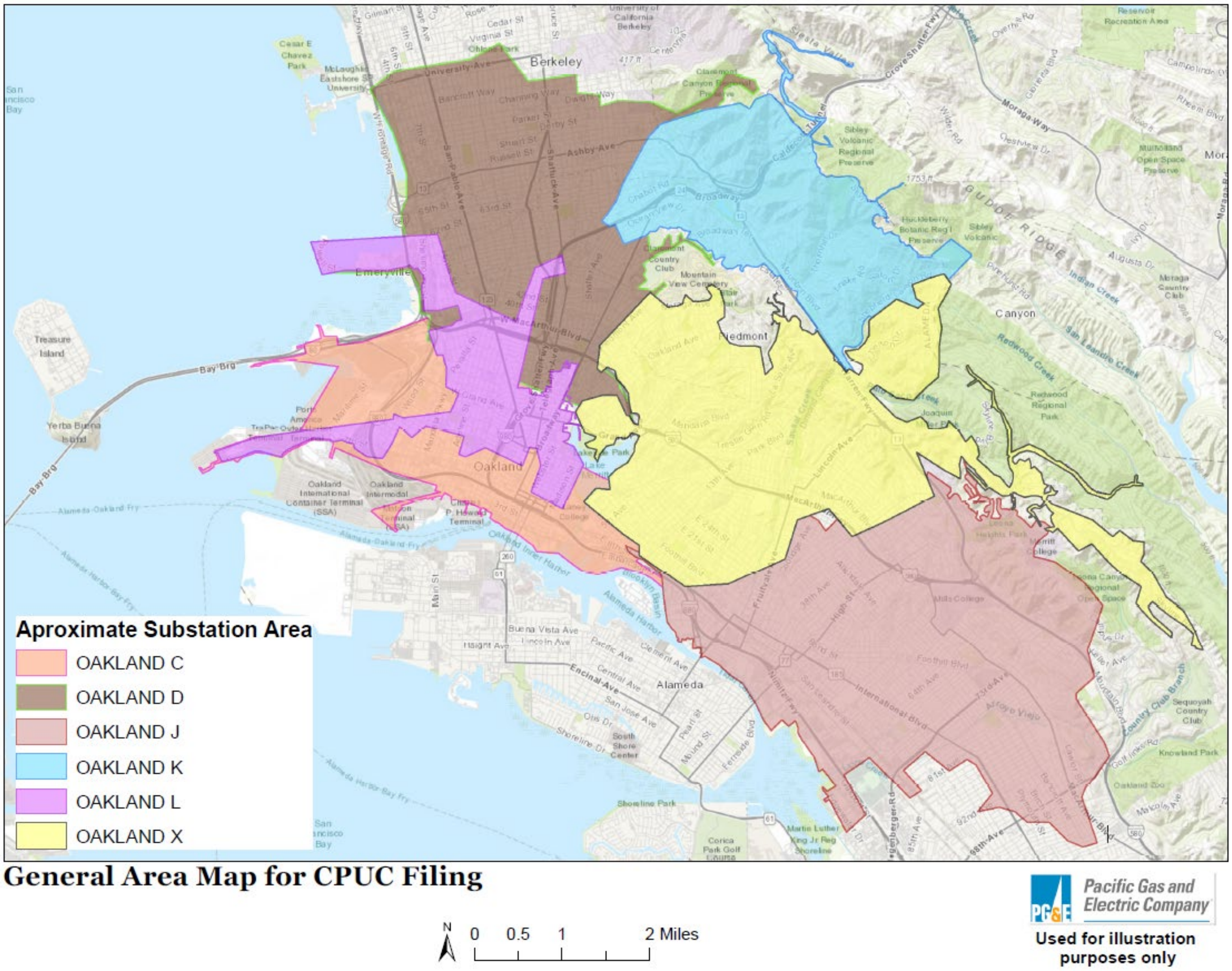
- Rebuild Moraga–Oakland X 115 kV four-line path with three lines with conductor rated for 1,100 amperes (amps) or higher summer emergency rating.
- Reconductor Moraga-Claremont circuits 1 and 2 115 kV lines with conductor rated for 1,100 amps or higher summer emergency rating.
- Build a new 115 kV line from Oakland X to Oakland L substation with conductor rated for 1,100 amps or higher summer emergency rating.
- Upgrade Moraga 230 kV Bus (add sectionalizing breakers and a bus tie breaker to Moraga 230 kV bus).

Exhibit 2-1. East Bay Transmission System



Notes: 230 kV system is shown in blue, 115 kV system is shown in fuchsia. A thicker line is a substation and a thinner line is a power line between two substations. An oval around adjacent lines indicates a double-circuit line. A circle is a circuit breaker. The partial cloud or wave symbol (nnn or uuu) indicates a substation transformer between 230 kV and 115 kV. A forward slash is a switch. A system component that is Normally Open is shown in green and labeled with NO. Generation is a shown as a circle divided into three equal sections.

Exhibit 2-2. Approximate Area of Six Distribution Substations Associated with Project



In the final 2019-2020 TPP (p. 107), CAISO summarized its position on the proposed project scopes as follows:

> *Out of the four scopes mentioned above, the ISO has separately recommended approval of the Moraga 230 kV bus upgrade as this project also provides benefit and mitigates overloads identified in the Diablo division.*
>
> *Building of a new 115 kV line from Oakland X to Oakland L substation could address long-term need of serving growing load at Oakland D & L substations beyond what has been identified in this year's assessment. As such, the ISO will continue to monitor need for this part of the scope in future cycle.*
>
> *Rebuilding of Moraga-Oakland X 115 kV four-line path with three lines and reconductoring of the Moraga-Claremont #1 & #2 115 kV lines are primarily driven by CPUC GO-95 compliance and the work will be performed under PG&E's maintenance budget. The ISO reviewed and concurs with the proposed scope of work.*

CASIO concurred with the project scope of work, recognizing the project was primarily driven by CPUC GO 95 compliance and would be performed under PG&E's maintenance budget (CAISO 2020).

The proposed rebuild of the Moraga–Oakland X 115 kV four-line path project described in the 2019-2020 TPP has been modified since the 2019 submittal to the CAISO. PG&E now proposes to rebuild Moraga–Oakland X 115 kV four-line path with four circuits that each have conductor rated for 1,212 amps or higher summer emergency rating. Project scopes 2, 3, and 4 have independent utility and are not included in the proposed project. PG&E plans to submit the revised project scope for project 1 (the proposed project) to the CAISO detailing the proposed project to rebuild four lines instead of only three lines in the next CAISO TPP.

Moraga Substation's equipment that connects to the project power lines includes 115 kV circuit breakers rated for 3,000 amps and the 115 kV air switches rated for 2,000 amps. The equipment ratings are not intended to change as part of the proposed project. Oakland X Substation's equipment that connects to the project lines includes 115 kV circuit breakers rated for 2,000 amps and a 115 kV bus rated for 703 amps. The circuit breaker equipment ratings are not proposed to change as part of the proposed project. The 115 kV bus is proposed to be upgraded to 1,181 amps.

The proposed project will not exceed or combined the project described in the CAISO TPP 2019-2020. PG&E's proposed project will modify the CAISO TPP 2019-2020 described project by rebuilding four lines instead of three lines of the existing four-line path. Since 2020, modern cable type technology allows rebuilding four lines instead of three lines within limited ROW and city franchise streets while maintaining CPUC GO 95 requirements. When PG&E originally proposed the project to CAISO, the modern cable type technology was not available to rebuild all four lines and achieve CPUC GO 95 requirements, which is why rebuilding three lines was proposed at the time.

The proposed project was not part of a competitive bid process because it is a maintenance project and rated at 115 kV.

2.1.2 Project Objectives

The basic objectives of the project are as follows:

- Provide lifecycle updates of Moraga–Oakland X 115 kV four circuit power line path by removing and replacing four circuits to avoid future reliability issues while maintaining safe operations.
- Replace four project power line circuits using a larger size conductor that will accommodate the region's reasonably foreseeable future energy demands.
- Ensure the project at completion meets power line reliability and safety requirements, and industry standards.
- Construct a safe, economical, and technically feasible project that minimizes environmental and community impacts.

The project will provide lifecycle updates of the Moraga–Oakland X 115 kV four-line path to avoid future reliability issues while maintaining safe operations. This objective will be achieved by replacing or eliminating the structures and overhead lines. The project proposes to replace existing power line structures with new structures or with underground line components. Some existing power line structures are proposed to be eliminated instead of replaced, which will achieve the life cycle update by removing the aging structure from operation.

The project will accommodate the reasonably foreseeable future energy demands of the region by installing a larger size conductor that can carry more power. This objective will be achieved by replacing current conductors, which have a summer emergency rating of 406 amps, with conductors that have a summer emergency rating of 1,212 amps. The north Oakland area, as depicted on Exhibit 2-2, is experiencing a rapid load increase from industrial and commercial growth and the rise in electrical vehicle charging and electrification loads. Based on the latest 2024-2025 TPP load forecast, the north Oakland area load is expected to increase significantly in the next 15 years. The local area demand (which includes Oakland K Substation, Oakland X Substation, Oakland C Substation, Oakland D Substation, Oakland L Substation, City of Alameda's Cartwright, and the Port of Oakland) is projected at approximately 376.7 megawatts (MW) in 2024 and is expected to reach approximately 458.2 MW by the year 2039. PG&E is forecasting energy demand at Oakland X Substation to be as shown in Table 2.1-1.

Table 2.1-1. Oakland X Substation 10-Year Annual and 15-Year Load Forecast

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2039
Megawatts	43.3	43.0	47.7	50.4	53.4	54.5	57.1	59.5	62.3	64.9	71.4	103.1

Source: PG&E Transmission Planning 2024

Note: PG&E typically forecasts load annually for up 10 years. CAISO requested a data point at 15 years from PG&E.

The proposed project does not include a rating increase. The project at completion is expected to continue to operate the four circuits their current summer emergency rating of 406 amps each.

The project will meet power line reliability and safety requirements and industry standards at completion. This objective will be achieved by designing and installing the replacement power line structures to meet minimum ground to conductor requirements in GO 95 and maintain consistency with the 2010 NERC recommendations to the industry. To ensure safe power line operation, GO 95 specifies the required minimum distance between ground and conductors that must be maintained for a variety of land uses beneath power lines. CPUC GO 95 regulates all aspects of design, construction, operation, and maintenance of electrical power lines and fire safety hazards for utilities subject to its jurisdiction. In accordance with the GO 95 requirements, PG&E has measured the existing distance between the conductors and the ground or land use (for example, a structure). There are no non-compliances GO 95 on the existing line, and the proposed project will meet GO 95 requirement and 2010 NERC recommendations at project completion.

The 2010 NERC recommendations asked electric utility owners to verify actual field conditions to review if the facility rating were within design tolerances. Line ratings depend on many limiting factors, including line facility placement, structure height, topographical profiles, and maintaining adequate conductor clearances (that is, conductor-to-ground and conductor-to-conductor) under a variety of ambient and loading conditions. The proposed project is designed with the limiting factors of project's field conditions to allow the existing line rating to be maintained.

The project will construct a safe, economical, and technically feasible project that minimizes environmental and community impacts. This objective will be achieved by constructing a safe, economical, and technically feasible replacement power line path that minimizes environmental and community impacts in comparison to project alternatives.

Lines 1 and 2 were installed circa 1908 and Lines 3 and 4 were installed circa 1931. Line structures and foundations have a typical lifespan of approximately 75 years, and conductors typically have a lifespan of approximately 50 years. The project will replace or eliminate existing line structures that have reached the end of their useful life. Ongoing operation and maintenance inspections of the existing lines have found corrosion issues on the steel structures that will be best remedied by replacing or eliminating the structures. In 2020, two line structures with corrosion issues were replaced in kind. In 2021, when five line structures with corrosion issues were identified, four line structures were replaced and one line structure was eliminated. The project will replace or eliminate the remaining aging line structures instead of waiting for corrosion issues to dictate replacement, ensuring safe operation with new line components.

2.1.3 Project Applicant

PG&E is the project applicant for the proposed project and will modify its existing PG&E facilities for all components of the proposed project. Communication equipment owned by AT&T located on two PG&E structures will be relocated by AT&T.

PG&E provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California. The PG&E service area stretches from Eureka in the north to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada Range in the east. Electric interconnected transmission lines cover approximately 18,466 circuit miles to serve approximately 5.5 million electric customer accounts. The project is within

PG&E's Bay Area Region, which serves approximately 1.8 million electric customers in Contra Costa, Alameda, San Francisco, and San Mateo counties. Approximately 27,200 electric and gas line miles are in the Bay Area Region. The project's four-line 115 kV path is one of the 115 kV paths that serve customers in cities of Oakland, Piedmont, and Alameda in the eastern counties of the Bay Area Region.

The project is part of a local 115 kV system that delivers power to six PG&E distribution substations in the north Oakland area, which serve approximately 200,000 customers, as well as the Port of Oakland's municipal electric utility, the Schnitzer Steel plant, and the City of Alameda's Cartwright Substation. The north Oakland area serves customers in the cities of Oakland, Piedmont, and Alameda.

2.2 Pre-filing Consultation and Public Outreach

This section describes pre-filing consultation and public outreach that has occurred for this project.

Pre-filing consultation and public outreach has occurred with CAISO, CPUC, public agencies with jurisdiction over the project area, Native American tribes affiliated with the project area, other utility owners and operators, and the local community and public.

2.2.1 California Independent System Operator

In CAISO's 2019-2020 TPP assessment, CASIO concurred with the project scope of work, recognizing the project was primarily driven by CPUC GO 95 compliance and would be performed under PG&E's maintenance budget (CAISO 2020). PG&E plans to submit the revised project scope to the CAISO detailing the proposed project to rebuild four lines instead of only three lines in the CAISO TPP 2024-2025.

2.2.2 Public Agencies and Other Entities with Jurisdiction over Project Areas or Resources that May Occur in the Project Area

PG&E coordinated or will coordinate with public agencies or other entities with jurisdiction over project areas or resources that may occur in the project area during the development of the project application. Coordination discussions included a project overview, purpose and need, options being considered to replace the lines overhead or underground, the typical permitting steps and timeline, and a request for early input on the project.

2.2.2.1 California Department of Fish and Wildlife

PG&E briefed California Department of Fish and Wildlife (CDFW) staff members in March 2020 on the project and replacement options and requested information on project compatibility with conservation easements (CEs), protected species, and habitats. Department staff members thought potential impacts to special-status species and their habitat would be less if the lines were replaced in their existing overhead alignment instead of being replaced underground. Additional impacts associated with undergrounding of the lines and new easements required seemed to be beyond what was envisioned or intended in the CEs. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.2 California Department of Transportation

PG&E will communicate with the California Department of Transportation (Caltrans) after receiving approval from the CPUC to replace the power line structures across State Route (SR) 13 within the existing easement. PG&E expects to discuss the existing encroachment permit after CPUC project approval.

2.2.2.3 California Public Utilities Commission

PG&E included the project in its quarterly presentations to the CPUC as part of its effort to present projects that were expected to be licensed under GO 131-D. In March 2021, PG&E provided an overview of the project during an online meeting with the CPUC project manager and an initial project filing schedule was discussed. In December 2023 during an online meeting, PG&E provided an updated project schedule, project description and discussed pre-filing coordination with a new CPUC project manager. In March 2024, PG&E presented a project summary during an online meeting with the CPUC and the CPUC consultant. In May 2024, PG&E presented the project summary to a new CPUC project manager, discussed pre-filing coordination, and began biweekly consultation meetings online with the CPUC and the CPUC consultant.

2.2.2.4 City of Piedmont

PG&E briefed City of Piedmont staff members in the City Administrator, Fire Chief, and Planning and Public Works departments in February and August 2020 on the project and replacement options and requested information on project compatibility with existing and planned land uses, zoning, and projects. The discussion focused on project components, replacement options, planning for public communication explaining the proposed project and coordination with the city as the project progresses. Project alternative discussion is inclusive of the city's interest in infrastructure hardening and reduction of wildfire risk. A meeting was held on October 15, 2024, to communicate PG&E's plans to file the Permit to Construct (PTC). The city asked what would become of PG&E property where power line structures were proposed to be removed. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.5 City of Oakland

PG&E briefed City of Oakland staff members in the Public Works, Transportation, Electrical Services and Construction departments in January 2020 on the project and replacement options and requested information on project compatibility with existing and planned city services, Public Works and transportation uses, and projects. The discussion focused on project components, replacement options and coordination with the city as the project progresses. Staff members shared that Park Boulevard east of its intersection with Estates Drive is supported by three viaducts. PG&E was encouraged to talk with the Parks and Recreation Department for more information about the project near Dimond Park and canyon. Staff members noted that wider streets with commercial use, such as Park Boulevard and Lincoln Avenue, were likely more compatible with underground lines than narrow residential streets. In general, removing lines where residences were built underneath would likely be supported. City road projects within Park Boulevard between Estates Drive and Oakland X Substation are planned, and coordination with the city during final design is encouraged.

PG&E briefed City of Oakland staff members in the Parks, Recreation and Youth department in March 2020 on the project and replacement options and requested information on project compatibility with existing and planned park, recreation, and youth uses. The discussion focused on project components and replacement options. Replacing the span over Dimond Park was seen as more compatible than a replacement span in a new alignment. Placing the lines underground was seen as more compatible than a new overhead alignment. Staff members noted several schools are along Park Boulevard and Lincoln Avenue. The proposed project, which will not include a replacement line in Lincoln Avenue, reduces the proposed project's proximity to schools. PG&E also met with the City of Oakland staff members the Parks, Recreation and Youth department and Economic and Workforce Development department in May of 2023 to discuss placement of two transition structures on City of Oakland property on the south side of Park Boulevard near the intersection of Estates Drive.

PG&E briefed City of Oakland staff members in the Planning and Building, Public Works, and Transportation departments in July 2020 on the project and replacement options and requested information on project compatibility with existing and planned land uses, zoning, and projects. After summarizing the previous meetings with the city, the discussion focused on project components, replacement options, and coordination with the city as the project progresses. The city's Park Boulevard roadway redesign was continuing, and PG&E was encouraged again to consider the redesign as part of project planning. Work expected at Oakland X Substation is not expected to include civil or electrical work on the building structure that will require planning commission support or city permits. A meeting was held on November 12, 2024 to communicate PG&E's plans to file the PTC. The city asked how the project would support the city with its electrification. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.6 City of Orinda

PG&E briefed City of Orinda staff members in the City Manager, Planning, and Public Works departments in January and July 2020 on the project and replacement options and requested information on project compatibility with existing and planned land uses, zoning, and projects. The discussion focused on project components, replacement options, planning for public communication explaining the proposed project, and coordination with the city as the project progresses. Project alternative discussion is inclusive of the city's interest in the feasibility of replacing the lines underground in the eastern section of the project as well as wildfire risk reduction resulting from the existing lines being replaced with new overhead components. A meeting was held on November 13, 2024 to communicate PG&E's plans to file the PTC. The city asked about anticipated aesthetics changes and alternatives to rebuild the lines underground. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.7 Contra Costa County

PG&E briefed Contra Costa County staff members in the Community Development, Public Works, and Building departments in August 2020 on the project and replacement options and requested information on project compatibility with existing and planned land uses, zoning, and projects. The discussion focused on project components, replacement options, and coordination with the County as the project progresses. A meeting was held on November 7, 2024, to communicate PG&E's plans to file the PTC. The county commented that it will be looking for compliance with the county tree ordinance and that road grading is subject to county permitting. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.8 East Bay Municipal Utility District

PG&E briefed East Bay Municipal Utility District (EBMUD) staff members and contractors who support the CEs in January and June 2020 on the project and replacement options. In addition to EBMUD watershed property crossed by the existing lines, CEs crossed by the existing lines or near the lines are expected to transition to EBMUD ownership. PG&E requested information on project compatibility with existing and planned land uses and projects.

The discussion focused on project components, replacement options, and coordination with EBMUD as the project progresses with an emphasis on erosion and sediment control for construction activities. EBMUD supports replacing the lines overhead in the existing alignment. EBMUD discussed that rebuilding in the existing alignment would be the least impactful from an environmental perspective and would align best with stakeholders/landowners' interests, including CEs. EBMUD discussed moving the lines to a new alignment may have a greater impact, including direct impact to resources not currently in the alignment or near the existing lines. A meeting was held on October 29, 2024, to communicate PG&E's plans to file the PTC. EBMUD provided comment that certain construction activities may be constrained by the presence of nesting birds. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.9 East Bay Regional Park District

PG&E briefed East Bay Regional Park District (EBRPD) staff members in January 2020 on the project and replacement options and requested information on project compatibility with existing and planned land uses and projects. EBRPD discussed a creek restoration and recreational development project in the EBRPD Sibley Volcanic Regional Preserve, McCosker Sub-Area, accessed at Eastport Staging Area on Pinehurst Road. EBRPD staff members noted that parallel spans of the existing 115 kV lines are over the planned campground area. If the replaced lines were not over the campground area, aesthetics would

likely be improved during recreational use, such as star gazing at night. Existing structures tend to be on knolls, and replacement considers access, work areas, and minimization of tree removal, as well as potential environmental and park use impacts. PG&E looks to minimize new roads or road improvement by using existing access whenever possible. Other than the discussed structures relocation, rebuilding overhead in the existing alignment was seen as potentially the lowest impact by EBRPD, would be the least impactful from an environmental perspective, and would align best with minimizing potential impact to Alameda Whipsnake Habitat. EBRPD discussed moving the lines to a new alignment may have a greater impact, including direct impact to resources not currently in the alignment or near the existing lines. Meetings in June 2020 and March and July 2021 were focused on updating the potential campground alignment feasibility and non-project coordination to replace power line structures with corrosion, which are maintenance activities that had independent utility from the proposed project.
A meeting was held on October 27, 2024, to communicate PG&E's plans to file the PTC. EBRPD discussed the recreational use in the vicinity of the line and expressed interest in PG&E's expected use of its existing programmatic resource agency permits for this project. No conflicts or concerns were communicated to PG&E for the proposed project other than the reducing the existing visibility of the existing lines near the planned campground.

2.2.2.10 United States Fish and Wildlife Service

PG&E briefed United States Fish and Wildlife Service (USFWS) staff members in March 2020 on the proposed project and replacement alternatives (including replacement in an underground configuration) and requested information on project compatibility with CEs, protected species, and habitats. Service staff members thought potential impacts appeared to be less with replacing the lines in the existing overhead alignment instead of replacing the lines in an underground configuration. No conflicts or concerns were communicated to PG&E for the proposed project.

2.2.2.11 Wildlife Heritage Foundation

PG&E briefed Wildlife Heritage Foundation staff members in December 2019 on the proposed project and replacement alternatives (including replacement in an underground configuration) and requested information on project compatibility with the CEs and associated management plans in the eastern section of the project. While power lines are expected to be senior to the CEs, typically activities that do not benefit the easement purpose are not allowed. If the alignment would move outside of the existing PG&E land rights, the proposed activities would need to have no change in conservation purpose, no net loss of conservation value, and no private benefit. Changes to land rights would involve review and approval by USFWS, United States Army Corps of Engineers (USACE), State of California Attorney General, CDFW, Regional Water Quality Control Board (RWQCB), and other third-party beneficiaries. No conflicts or concerns were communicated to PG&E for the proposed project beyond the discussion of the CE constraints.

2.2.3 Native American Tribes Affiliated with the Project Area

Native American Heritage Commission (NAHC) was contacted requesting a Sacred Lands File (SLF) search of the project area on December 1, 2023. The NAHC's response, dated December 4, 2023, stated that no Native American cultural sites are documented within the area of potential impact (API). The NAHC also provided a list of 25 individual Native American contacts who may have knowledge about archaeological and tribal cultural resources in the area. Initial outreach letters were sent to the contacts listed by the NAHC on January 9, 2024. This letter included information about the proposed project, cultural resource findings to date, and a map showing the project location. The letter also invited comments or questions relating to the project. Hard copies were sent to the addresses provided by the NAHC, along with electronic copies sent via email. To date, three responses have been received requesting record search results, SLF search results, project archaeological reports, cultural resources assessment and recommendation, and the final environmental document for the project. Available information was provided, and other information will be provided when complete. This correspondence timeline and responses are summarized in Table 5.18-1. Coordination between PG&E and the responding tribes regarding the project is currently underway, and formal comments or recommendations provided by the tribes (if any) will be addressed by PG&E cultural resources specialists. Consultation under Assembly Bill (AB) 52 will be conducted, with CPUC serving as the lead state agency.

2.2.4 Private Landowners

PG&E held public open houses and gathered information from local community attendees. Two open houses were held in Oakland on April 22, 2024, 5:00 p.m. to 8:00 p.m. and April 25, 2024, 5:00 p.m. to 8:00 p.m., and one open house was held in Orinda on April 30, 2024, 1:00 p.m. to 4:00 p.m. The open houses were announced to the public via direct mail and publicized online on the project webpage. Postcards were sent to approximately 5,000 residents and businesses within 1,000 feet of the proposed project. Event materials were made available in English and Spanish. Local elected officials in the Orinda, Oakland, and Piedmont communities also were informed about the open houses.

The open houses attracted 66 attendees. Most attendees were customers who were notified of the open houses through the postcards distributed to residents and businesses within 1,000 feet of the proposed project. Attendees were largely interested in learning about the possibility of undergrounding, as well as the proposed construction timeline for the project. In addition, some attendees expressed concern about how the proposed project would affect their home and neighborhood, in terms of potential power shutoffs during construction as well as wear and tear on the roads from construction vehicles.

Almost all attendees visited each station of the open house, interacting with subject matter experts while reviewing informational boards and asking questions. The aerial map in the center of the room elicited the most interest, with many attendees taking the time to point out the exact location of their homes/neighborhoods in relation to the proposed project. Many attendees shared with project team members an appreciation of the open house as an opportunity to have all their specific questions answered and learn more about the project's next steps.

Most of the comments received revolved around support for undergrounding within Park Boulevard and expressed the timeliness of this part of the proposed project and the positive effect this change would have on customers in this area. Some attendees used the comment cards to provide general positive feedback about the overall project, as well as thanking the project team for being able to answer their questions directly and stressing the importance of construction noticing. One suggestion inquired about moving replacement structure locations farther away from their residential view. One attendee expressed concern about their family's health, citing a concern about lead exposure from new towers. (New structures will not contain lead or have lead-based paint.) This comment included a preference for undergrounding in Park Boulevard to avoid structures with lead near their home. Two comments received provided feedback about vegetation management around areas along the proposed route. One comment suggested planting low growing, native plants under the power lines in Montclair rather than removing the vegetation altogether. Another comment suggested replacing trees and landscaping around Oakland X Substation to replace what was removed in the past few years.

2.2.5 Other Utility Owners and Operators

PG&E will communicate with AT&T after receiving approval to replace the power line structures with AT&T equipment. The communication will include the timing of construction and the change associated with the existing AT&T facilities located on PG&E structures.

2.2.6 Federal, State, and Local Fire Management Agencies

PG&E has not communicated with federal, state, or local fire management agencies regarding the project other than in a general discussion with the City of Piedmont.

2.2.7 Significant Outcomes

No significant outcomes of consultation were incorporated into the project. PG&E considered public input and preferences during project development. Alternatives described in Chapter 4 reflect the project as originally proposed to CAISO as well as public interest in undergrounding portions of the rebuilt lines and EBRPD interest in reducing aesthetic impacts of structures.

No areas of controversy or major issues related to the project have been communicated to PG&E by representatives from Contra Costa County, City of Oakland, City of Orinda, City of Piedmont, EBMUD, EBRPD, CDFW, USFWS or others contacted as described in Section 2.2.

2.2.8 Development that Could Coincide or Conflict with Project Activities

PG&E is not aware of any developments that could coincide or conflict with project activities. No outreach to developers of large housing or commercial projects occurred; none are known to occur within or adjacent to the project alignment.

2.2.9 Records of Consultation and Public Outreach

Public open house information is available at the following weblink: https://www.pge.com/en/about/pge-systems/electric-systems/electric-systems-projects/pge-moraga-oakland-rebuild-project.html. Appendix 2 provides a table with contact information and a copy of materials used in meetings with EBMUD, EBRPD, and city and county entities in October and November 2024.

2.3 Environmental Review Process

The project will be subject to environmental review under CEQA.

2.3.1 Environmental Review Process

The state environmental review process schedule is anticipated to begin in the last quarter of 2024. During the Pre-filing Consultation with PG&E, CPUC has indicated that it expects the project's CEQA document will be an Environmental Impact Report (EIR). CPUC 2019 PEA Guidelines provide a calculated duration of 29 months for an EIR CEQA document after the project application is filed.

2.3.2 California Environmental Quality Act Review

CEQA requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects and to reduce those environmental impacts to the greatest extent feasible. The laws and rules governing the CEQA process are contained in the CEQA statute (Public Resources Code [PRC] Section 21000 and following), the CEQA Guidelines (California Code of Regulations [CCR], Title 14, Section 15000 [14 CCR 15000] and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures.

2.3.2.1 CPUC as CEQA Lead Agency

Pursuant to GO 131-D, PG&E is applying to the CPUC for a PTC authorizing PG&E to construct the project. Further, pursuant to GO 131-D, to issue a PTC, CPUC must find that the project complies with CEQA. Therefore, the CPUC will be the lead agency under CEQA for the project because it has the greatest responsibility for supervising or approving the project as a whole (14 CCR 15051(b)).

2.3.2.2 Other State and Federal Agencies that May Have Discretionary Permitting Authority

The San Francisco Bay RWQCB, among others, may have discretionary permitting authority over aspects of the project.

2.3.2.3 Federal, State, and Local Agencies Not Expected to Have Discretionary Permitting Authority

Caltrans, City of Oakland, City of Orinda, City of Piedmont, and Contra Costa County are expected to have ministerial permitting authority over aspects of the Project.

2.3.2.4 Results of Preliminary Outreach with Agencies

PG&E has not been made aware of any unexpected issues that will affect the CEQA process as a result of the preliminary outreach with agencies described in Section 2.2.1 or in review of posted ministerial permitting processes on agency websites.

2.3.3 National Environmental Policy Act Review (not applicable)

No portions of the project are on federal lands, and the project is not known to potentially result in impacts to federal jurisdictional waters or wetlands or federally listed threatened or endangered species that will require discretionary approvals subject to review under the National Environmental Policy Act (NEPA).

2.3.4 Pre-filing CEQA and NEPA Coordination

Pre-filing coordination with the CEQA review agency, the CPUC, is described in Section 2.2.

2.4 Document Organization

2.4.1 Proponent's Environmental Assessment Organization

This PG&E PEA document contains the following chapters as set forth in the CPUC's Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments, dated November 2019, Revision 1.0.

2.4.1.1 Chapter 1, Executive Summary

This chapter includes a summary of the project, a discussion of the land ownership and ROW requirements, a presentation of the areas of controversy identified to date, a summary of potential impacts, a summary of alternatives to the project, a summary of the pre-filing consultation and public outreach performed to date, a summary of the major PEA conclusions, and a listing of remaining major issues that remain to be resolved.

2.4.1.2 Chapter 2, Introduction

This chapter includes a presentation of the purpose and need for, and objectives of, the project. It identifies the applicant, details the pre-filing consultation and public outreach activities conducted to date, outlines the environmental review process, and establishes the organization of the PEA document.

2.4.1.3 Chapter 3, Project Description

This chapter includes an overview of the project; a description of the existing and proposed system; a presentation of the project components; information related to land ownership, ROW, and easements; a description of the construction methodologies to be employed; data regarding the construction workforce, equipment, traffic, and schedule; information on post-construction activities; a discussion of operation and maintenance-related work; decommissioning-related information; a listing of anticipated permits and approvals; and a table presenting applicant-proposed measures.

2.4.1.4 Chapter 4, Description of Alternatives

This chapter identifies and describes alternatives to the project, including a discussion of a No Project Alternative. It also lists alternatives identified and considered but rejected.

2.4.1.5 Chapter 5, Environmental Analysis

This chapter includes a description of the environmental setting, regulatory setting, and impact analysis for each resource area. The resource areas addressed include each environmental factor (resource area) identified in the most recently adopted version of the CEQA Guidelines Appendix G checklist and any additional relevant resource areas and impact questions that are defined in the CPUC's PEA checklist.

2.4.1.6 Chapter 6, Comparison of Alternatives

This chapter compares each alternative described in Chapter 4 to be carried forward for PEA evaluation against the project in terms of each alternative's ability to avoid or reduce a potentially significant impact. It also provides a detailed table that summarizes the applicant's comparison results and ranks the alternatives in order of environmental superiority.

2.4.1.7 Chapter 7, Cumulative Impacts and Other CEQA Considerations

This chapter provides a detailed table listing past, present, and reasonably foreseeable future projects within and surrounding the project (within an approximately 2-mile buffer); presents a cumulative impact analysis; and provides an evaluation of potential growth-inducing impacts.

2.4.1.8 Chapter 8, List of Preparers

This chapter lists the major authors and preparers of the PEA document.

2.4.1.9 Chapter 9, References

This chapter includes a list of references cited in this PEA.

2.4.1.10 Required PEA Appendices and Supporting Materials

PG&E is submitting with this PEA the "Required PEA Appendices and Supporting Materials" listed in the CPUC's Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments, dated November 2019, Revision 1.0, that are applicable and necessary to support the environmental impact analyses contained in Chapters 5 and 6. An index to CPUC PEA Guidelines Requirements is provided in Appendix 3.

3. Proposed Project Description

3.1 Project Overview

The Pacific Gas and Electric Company (PG&E) Moraga–Oakland X 115 kV Rebuild Project (project) proposes to upgrade the approximately 5-mile length of four overhead 115 kV power lines (lines) between Moraga and Oakland X substations. Refer to Figure 3.1-1. The two existing parallel double-circuit 115 kV power lines (for a total of four circuits) are located within existing PG&E land rights. Each line supports a 115 kV circuit to either side of a power line structure (a tower or a pole). The project will rebuild the four overhead lines into four hybrid lines, with hybrid defined as lines between the two substations having both overhead and underground portions. Most existing line structures and all existing conductors will be replaced with overhead rebuild or underground components. Recently replaced existing structures are expected to be reused with minor to moderate modification. The overhead rebuilt lines will have similar line structures with the existing configuration where two lines are on parallel sets of line structures in the eastern and central sections of the project. The western section will include lines replaced overhead with similar line structures and transition structures connecting underground line components buried in city streets and into Oakland X Substation. The rebuild will include installation of a static ground wire (SW) and an optical ground wire (OPGW) on either side of the top arm of each power line structure. Grounding and a communication path continue within the underground portions. AT&T telecommunication equipment located on two existing structures will be removed by AT&T and may be relocated to another AT&T location. Minor modifications will occur within the existing substations.

The proposed project will be located within the City of Orinda, unincorporated areas of Contra Costa County, and the cities of Oakland and Piedmont within Alameda County (refer to Figure 3.1-1). The project starts in the City of Orinda at Moraga Substation, which is located approximately 2.5 miles southeast of SR 24. The existing parallel double-circuit lines progress generally southwest and cross through hilly open space and park land in unincorporated Contra Costa County, through an area mainly owned by EBRPD and EBMUD, to the top of the Oakland Hills; this section is referred to as the eastern section. At this point, the existing parallel double-circuit lines enter the City of Oakland within Alameda County, where the land use changes to an area of predominantly residential use with some recreational areas. The existing parallel double-circuit lines continue southwest down the western side of the Oakland Hills, crossing Skyline Boulevard and paralleling the general alignment of Shepherd Canyon Road to SR 13; this section is referred to as the central section. From SR 13, the existing parallel double-circuit lines match the general alignment of Park Boulevard to Oakland X Substation; this section is referred to as the western section. Approximately 0.25 mile of the existing alignment, with two existing double-circuit line structures, is within the City of Piedmont in the western section. Oakland X Substation is approximately 0.10 mile east of Interstate 580 (I-580) near its intersection with Park Boulevard.

The proposed rebuild is in the same area as the existing parallel double-circuit lines for approximately 4 miles in the eastern section, the central section, and the beginning one-third of the western section. Approximately 1 mile, or the remaining two-thirds, of the existing parallel double-circuit lines in the western section is proposed to be rebuilt in an underground alignment south of the existing overhead alignment. Approximately 15 existing parallel double-circuit structures will be removed after the double-circuit lines are rebuilt underground. The underground portion will be mainly in Park Boulevard in the City of Oakland between the intersection of Estates Drive and Park Boulevard and Oakland X Substation. The northern parallel double-circuit line will transition underground in the City of Piedmont on the north side of the intersection of Estates Drive and Park Boulevard. The southern parallel double-circuit line will transition underground in the City of Oakland on the south side of the intersection of Estates Drive and Park Boulevard. Each underground double-circuit line will be in opposite sides of Park Boulevard heading toward Oakland X Substation. Each underground double-circuit line will turn onto Park Boulevard Way to reach the Oakland X Substation property.

Major geographic features in the project area include the hilly open space and regional park land in the eastern section with Moraga Substation adjacent to the upper reaches of Moraga Creek. The topography in the area includes rolling hills, vegetated canyons, and higher elevations in the eastern and central sections of the project. In the central section, the hilly area is on the northwestern side of Shepherd Canyon with its intermittent daylighted sections of Shephard Creek. The Hayward fault line bisects the project's central and western sections with its location generally along SR 13. Shephard Creek feeds into Sausal Creek west of SR 13 and continues southwest in the City of Oakland's Dimond Canyon Park south of Park Boulevard towards I-580. A more gradual slope with less topographical variation occurs in the western portion of the project. Project elevation ranges from approximately 650 feet above sea level at Moraga Substation to approximately 1,370 feet above sea level when the lines crest the Oakland Hills and then to approximately 140 feet above sea level at Oakland X Substation.

3.2 Existing and Proposed System

The existing and proposed systems include modification to PG&E electrical power lines and substations as well as telecommunication facilities. The AT&T equipment on the power line structures does not connect with the existing system and is discussed in site preparation activities in Section 3.5.4. Refer to Exhibit 2-1 for schematic diagrams of the existing system features. The proposed system will not modify system features shown in Exhibit 2-1.

In subsequent sections of this report, a facility typically will be identified by its proper name. The use of the term "power line" will indicate a 115 kV power line, which may be single-circuit or double-circuit. The use of the term "lines" indicates the four-circuit power line path in the same general corridor and "line" will refer to one of the two double-circuit power lines. Circuits 1 and 2 are on the northern power line in the path, and the Circuits 3 and 4 are on the southern power line in the path. A "transition structure" refers to a tubular steel pole structure that transitions the power line between an overhead and underground configuration. The term "line structure" will be used unless the specific type of structure is discussed. The existing lines have four types of existing structures: lattice steel tower (LST), lattice steel pole (LSP), tubular steel pole (TSP), and light-duty steel pole (LDSP). The use of the term "transmission" describes the function of the power lines, which is electrical transmission occurring between the substations. Distribution lines and distribution substations are not part of the existing or proposed project systems; however, overhead distribution lines in the project area will be protected by guard structures when power line work is occurring overhead.

For identification within this document, the overhead power lines structures are numbered starting from the eastern-most structures by Moraga Substation, ending with the highest-numbered structures at the western end at Oakland X Substation. To distinguish between individual structures, each is identified by its location on the northern or southern line and as existing and rebuild: for example, existing north 1 (EN1) and existing south 1 (ES1) and rebuild north 1 (RN1) and rebuild south 1 (RS1). TN refers to new transition (riser) structures on the northern line and TS refers to new transition (riser) structures on the southern line. Transition structures are located where lines transition between overhead and underground portions.

3.2.1 Existing System

The existing system includes two parallel power lines, each with overhead double-circuit 115 kV power line structures, Moraga Substation, and Oakland X Substation. The project has no distribution, renewable energy, or energy storage component. No existing telecommunication lines are colocated on the power lines. Third-party AT&T mobile phone antennas, located on two existing power line structures, are not part of the system and are discussed in Section 3.3. An overview of the existing system components (alignment of parallel power lines and substations) is included on Figure 3.1-1. A view of the substations with individual existing overhead double-circuit power line structures is included on Figure 3.5-1.

3.2.1.1 Moraga–Oakland X Circuits 1 and 2 and Circuits 3 and 4

Circuits 1 and 2 are on the northern Moraga–Oakland X line and were installed circa 1908. Circuits 1 and 2 are installed on a total of 39 structures as detailed in Table 3.3-4. Circuits 3 and 4 were installed circa 1931 in a parallel alignment to the south of Circuits 1 and 2. Circuits 3 and 4 are installed on a total of 36 structures as detailed in Table 3.3-4. Refer to Figures 3.1-2a and 3.1-2b for images of existing structure types. Existing and proposed overhead power line structures have a double-circuit configuration, meaning each structure has two circuits. Each structure has three large arms on each side that each hold a conductor wire, which is a one of the three phases of power that make a circuit. A high-voltage power line uses three-phase power to move the electrical load. Each circuit is approximately 5 miles in length, for approximately 20 circuit-miles total. The existing circuits each have a summer emergency rating of approximately 406 amps. The endpoints of the circuit are at Moraga and Oakland X substations, where the system protection scheme for the circuit is controlled. Two of the existing towers supporting the power lines are within the fenced area of Palo Seco Substation; however, there is no power system connection with the distribution substation.

3.2.1.2 Moraga Substation

Moraga Substation is located within the City of Orinda on Lost Valley Drive near Don Gabriel Way. Moraga Substation was constructed starting in 1946 and ending in 1948. The existing substation includes 230 kV and 115 kV facilities, including telecommunication and supervisory control and data acquisition (SCADA) facilities along with a small retention basin and parking, storage, or laydown areas in the open-air fenced substation. Moraga Substation connects with the eastern line terminals of Moraga–Oakland X 115 kV Circuits 1, 2, 3, and 4 on the western side of the substation.

3.2.1.3 Oakland X Substation

Oakland X Substation is located within the City of Oakland on Park Boulevard near I-580. The substation is a reinforced concrete building that was built in 1908 and included 60 kV transmission facilities as well as a transformer between incoming alternating current power to outgoing 600, 1,200 or 1,500 volt (V) direct current, which connected into the local distribution system at the time. The substation's existing distribution facilities are not a project component. The substation facilities were modified to transmit 100 kV in 1909. Today, the substation's transmission facilities are connected to 115 kV facilities, including telecommunication and SCADA facilities. Areas for parking, storage, or laydown are within the substation fenceline adjacent to the substation building. A separate fenced area extends east of the substation building and the main substation yard. Current use of the separate fenced area includes a non-project shoo-fly pole and the westernmost spans of the project power lines. Oakland X Substation connects with the western line terminals of Moraga–Oakland X 115 kV Circuits 1, 2, 3, and 4 on its eastern building wall.

3.2.1.4 Existing System Users, Area, and Local and Regional Systems

The 115 kV system delivers power to six PG&E distribution substations, which serve approximately 200,000 customers in the cities of Oakland, Piedmont, and Alameda, as well as the Port of Oakland facility, the Schnitzer Steel plant, and the City of Alameda's Cartwright Substation. The PG&E customer base generally consists of the following:

- Approximately 90.2 percent residential accounts
- Approximately 7.0 percent commercial accounts
- Approximately 2.3 percent industrial accounts
- Approximately 0.4 percent other types of accounts
- Approximately 0.01 percent agricultural accounts

The Port of Oakland owns a municipal electric utility that provides electricity to Oakland International Airport, the majority of the Oakland Seaport, and some portions of land along the shoreline, which includes major industrial and commercial customers. The Port of Oakland procures power in wholesale and retail markets, which may be sourced from PG&E. The Port of Oakland receives its power through PG&E transmission lines. The City of Alameda's, Alameda Municipal Power is a municipal electric utility with approximately 38,000 customers.

3.2.1.5 Project and the Existing Local and Regional Systems

The project will fit into the existing local and regional systems in the same way as the existing system. Refer to Exhibit 2-1 for the existing system features that will remain the same when the proposed project is complete.

3.2.2 Proposed Project System

The proposed project system will remain the same as the existing project system and operate with upgraded components. The existing power lines will be upgraded by replacing or removing most of the existing line structures and replacing all conductors in the overhead portion and installing the underground portion. The upgraded lines will have a hybrid physical configuration, being overhead in the eastern and central sections of the project and transitioning to underground in the western section of the project. Colocated PG&E telecommunication lines will be installed on the overhead rebuild portion and within the duct bank of the underground portion and will connect into Moraga and Oakland X substations. An overview of the existing system components with the project in its proposed rebuild alignment is included on Figure 3.2-1. Refer to Exhibit 2-1 for the schematic diagram of the existing project that will not change with the proposed project.

Line equipment, communication equipment, and control systems to support the operation of the rebuilt lines will be upgraded or installed within the footprint of the existing substations.

3.2.2.1 Proposed Facilities Expected Capacities and Proposed System Changes

The rebuilt lines will each have a conductor that will accommodate a summer coastal emergency rating of approximately 1,212 amps. Replaced substation equipment connecting with the lines will have the same rating as existing equipment except for an Oakland X Substation 115 kV bus upgrade (refer to Section 3.3.3.4). However, the proposed project's four-path rebuild does not include line rerating and there are no reasonably foreseeable plans to increase existing capacity. The proposed system capacity is not anticipated to change from the existing system capacity.

3.2.2.2 Proposed Project Buildout

The proposed project will have a single buildout. Future line modification or expansion is not planned or reasonably foreseeable at this time.

3.2.2.3 Proposed System Users, Area, and Local and Regional Systems

There is no difference between the existing system and the proposed system. The project will rebuild the existing four-path 115 kV lines between Moraga and Oakland X substations. The proposed service area will continue to be within the PG&E bay area region with service to customers in the cities of Oakland, Piedmont, and Alameda.

3.2.3 System Reliability

The project is not a system reliability project. The existing system is not at a reliability risk. The project will not add a new system tie to the regional grid or loop any existing infrastructure.

3.2.4 Planning Area

The four Moraga–Oakland X 115 kV Lines are one of the 115 kV paths that deliver power into the north Oakland area. The path is part of a local 115 kV system that delivers power to six PG&E substations with distribution facilities in the north Oakland area (Claremont K, Oakland D, Oakland L, Oakland C, Oakland X and Oakland J substations). Approximately 200,000 PG&E customers in the cities of Oakland, Piedmont, and Alameda, as well as at the Port of Oakland facility, the Schnitzer Steel plant, and the City of Alameda's Cartwright Substation, are served by the six PG&E distribution substations.

3.3 Project Components

The proposed project components include the four existing overhead 115 kV circuits, which are proposed to be rebuilt as four 115 kV hybrid circuits with overhead and underground portions. Associated substation and telecommunication upgrades are required to support operation of the rebuilt lines.

3.3.1 Preliminary Design and Engineering

The project is currently at the 60 percent design stage, which provides the preliminary design and engineering for the physical, civil, and outdoor components. The remaining design and engineering will focus on adding design detail to be able to be used for construction, including substation system protection schemes and indoor components when the project is approved. Preliminary design drawings for the project are provided on Figures 3.3-3a, 3.3-3b, 3.3-3c, 3.3-3d, 3.3-4a, 3.3-4b, 3.3-4c, 3.3-6, 3.3-7, and 3.5-1.

3.3.2 Segments, Components, and Phases

Power line components include overhead upgrade (replacement with similar structures and conductor), overhead-to-underground transition structures, underground construction (replacement line installed underground), installation of colocated telecommunication lines, and overhead removal (removal of conductor and structures where not replaced with similar structures or overhead). A single project buildout or phase is planned for the construction activities on the lines and at the substations. Table 3.3-1 summarizes the construction components of the overhead and underground components of the project, including substation and telecommunication upgrades. Construction schedule details are included in Section 3.6.4.

Table 3.3-1. Construction Components, Phases, and Timing (Approximate Metrics)

Construction Phase & Timing	Components
Rebuild overhead lines Q2 2029 to Q3 2031	▪ Rebuild the two existing double-circuit 115 kV power lines from Moraga Substation to the transitions to underground near the intersection of Estates Drive and Park Boulevard. ▪ Replace, reuse, or remove existing structures, including installing transition structures. ▪ Install PG&E ground (SW) and telecommunication (OPGW) lines on the overhead rebuild. ▪ Test, commission, and place double-circuit 115 kV hybrid lines in service with underground rebuild portions constructed. ▪ Where the underground portion replaces existing overhead lines and after the rebuilt hybrid lines are in service, remove existing line structures near the intersection of Estates Drive and Park Boulevard to Oakland X Substation.
Rebuild western portion underground Q3 2028 to Q1 2030	▪ Construct two double-circuit duct banks, one for the northern line and one for the southern line, with in-road vaults in Estates Drive, Park Boulevard, and Park Boulevard Way. Design of the underground portion includes grounding. ▪ Install PG&E telecommunication lines within each duct bank of the underground portions with separate telecommunication vaults and access covers. ▪ Test, commission, and place 115 kV hybrid lines in service with overhead rebuild portion constructed.

Table 3.3-1. Construction Components, Phases, and Timing (Approximate Metrics)

Construction Phase & Timing	Components
Moraga Substation modification Q3 2029 to Q1 2030	▪ Replace two 115 kV circuit breakers and two 115 kV air switches in Moraga Substation. ▪ Review and update Moraga Substation system protection scheme within the existing control enclosure and telecommunication system associated with the rebuilt lines. ▪ No permanent modifications outside of or to the existing substation fenceline are planned.
Oakland X Substation modification Q3 2029 to Q1 2030	▪ Replace three 115 kV air switches and upgrade one 115 kV bus in Oakland X Substation. ▪ Review and update Oakland X Substation system protection scheme within the control room and telecommunication system associated with the rebuilt lines. ▪ No building modification is planned. No permanent modifications outside of or to the existing substation fenceline are planned.

Q1 = Quarter 1; Q2 = Quarter 2; Q3 = Quarter 3; Q4 = Quarter 4

3.3.3 Existing Facilities

The proposed project will modify and remove facilities as summarized in Table 3.3-2 and discussed in further detail in Sections 3.3.3.1 through 3.3.3.4. The subsequent sections summarize each project component in more detail. The existing double-circuit northern lines, Circuits 1 and 2, will be rebuilt with two circuits and will continue to operate as Circuits 1 and 2. Likewise, the existing double-circuit southern lines, Circuits 3 and 4, will be rebuilt with two circuits and will continue to operate as Circuits 3 and 4.

The lines will be rebuilt as four circuits in an overhead configuration in the eastern and central sections of the project. In the western section of the project, the lines will transition from overhead lines to underground lines at four transition structures, one for each circuit. The rebuilt southern line will transition to underground from two transition structures south of the intersection of Estates Drive and Park Boulevard. The rebuilt northern line will transition to underground from transition structures that replace the existing northern and southern overhead line structures near Estates Drive just north of its intersection with Park Boulevard.

The underground Circuits 1 and 2 will merge into one double duct bank and the underground Circuits 3 and 4 will merge into a separate double duct bank. The underground portions of the four circuits will continue in two separate double duct bank alignments in city streets from the transition structures to Oakland X Substation. The northern line will transition on two double-circuit transition structures to the existing Oakland X Substation terminals for Circuits 1 and 2. The southern line will transition on one double-circuit transition structure to the existing Oakland X Substation terminals for Circuits 3 and 4.

The existing overhead structures and lines west of their respective transition structures will be removed from the existing towers at the northwest corner of Park Boulevard and Estates Drive to Oakland X Substation.

Table 3.3-2. Types of Existing Facilities to be Removed or Modified, Approximate Metrics

Component	Facilities Removed	Facilities Modified
Moraga–Oakland X 115 kV Circuit 1 and Circuit 2, northern line	▪ Conductor, 2 circuits, 1.13 miles each (western section) ▪ 12 double-circuit structures ▪ 4 in central section ▪ 8 in western section	▪ Reuse 3 towers (eastern section with minor modifications) and 1 TSP (with moderate modifications, central section). ▪ Replace 22 structures (total for all sections), including 2 single-circuit structures (TN27A/B), to transition each line between overhead and underground portions (western section). ▪ Reconductor 2 circuits, 3.93 miles each (primarily eastern and central sections). ▪ Install underground cable, 2 circuits, 1.24 miles each, in a double-circuit duct bank and 5 to 10 vaults (western section). ▪ Install 2 double-circuit transition structures (TN28, TN29) to connect the underground line portion to the existing terminals at Oakland X Substation.
Moraga–Oakland X 115 kV Circuit 3 and Circuit 4, southern line	▪ Conductor, 2 circuits, 1.13 miles each (western section) ▪ 10 double-circuit structures ▪ 1 in eastern section (H-frame LDSP at ES8 A and B) ▪ 2 in central section ▪ 7 in western section	▪ Reuse 3 towers (with minor modifications, eastern section) and 1 TSP (with moderate modifications, central section). ▪ Replace 22 structures (total for all sections) and add 2 single-circuit structures (TS27A/B) to transition each line between overhead to underground portions (western section). ▪ Reconductor 2 circuits, 3.94 miles (primarily eastern and central sections), and add new parallel spans from RS26 to transition structures TS27A/B. ▪ Install underground cable, 2 circuits, 1.20 miles each, in a double-circuit duct bank and 5 to 10 vaults (western section). ▪ Install 1 double-circuit transition structure (TS28) to connect the underground line portion to the existing terminals at Oakland X Substation.
Grounding and Communication SW and OPGW	None	▪ Install 1 OPGW and 1 SW on each of the new overhead structures to provide grounding and data communication. OPGW will transition from overhead to underground as a fiber communication cable in a conduit in each double duct bank that will also have grounding installed. ▪ Install a telecommunication vault near each underground power line vault.
Third-Party (AT&T) Cellular Antennas	Antennas on ES26 and on EN29; AT&T may choose to relocate its equipment elsewhere.	None
Moraga Substation	None	▪ Replace two 115 kV circuit breakers and two air switches. ▪ Review and update system protection scheme and telecommunication facilities associated with lines. The OPGW on each double-circuit line structure will be connected into the substation.

Table 3.3-2. Types of Existing Facilities to be Removed or Modified, Approximate Metrics

Component	Facilities Removed	Facilities Modified
Oakland X Substation	None	▪ Replace three 115 kV air switches and upgrade one bus. ▪ Review and update system protection scheme and telecommunication facilities associated with lines. The telecommunication line in each double-circuit duct bank will be connected into the substation.

EN = existing structure northern line
ES = existing structure southern line
RN = rebuild structure northern line

3.3.3.1 Overhead Upgrades

The existing overhead 115 kV power lines are approximately 5 miles long and consist of the two parallel lines (northern and southern), both of which carry two circuits. Table 3.3-3 summarizes the overhead upgrades, as well as the underground relocation portion and overhead removal. After construction, each of the two circuits in the rebuilt Moraga–Oakland X 115 kV northern line will be approximately 5.17 miles long, including both overhead rebuild portion and underground portion. Each of the two circuits in the rebuilt Moraga–Oakland X 115 kV southern line will be approximately 5.14 miles long, including both overhead rebuild portion and underground rebuild portion.

Table 3.3-3. Power Line Facilities Design Summary, Approximate Length

Power Line Facilities Design Summary	Approximate Length
Overhead Upgrade – Rebuild	
Moraga–Oakland X 115 kV Circuits 1 and 2 (Moraga Substation to TN27A and TN27B at Estates Drive near Park Boulevard)	3.93 miles (x2)
Moraga–Oakland X 115 kV Circuits 3 and 4 (Moraga Substation to TS27A and TS27B at Park Boulevard near Estates Drive, includes new overhead spans to southern line single-circuit transition structures from ES30)	3.94 miles (x2)
Total Approximate Length of Overhead Circuit Rebuild (parallel lines)	15.74 miles
Relocation Underground	
Moraga–Oakland X 115 kV Circuits 1 and 2 (within Estates Drive, Park Boulevard, and Park Boulevard Way to TN27A and TN27B at Oakland X Substation)	1.24 miles (x2)
Moraga–Oakland X 115 kV Circuits 3 and 4 (within Park Boulevard and Park Boulevard Way to TS27A and TS27B at Oakland X Substation)	1.20 miles (x2)
Total Approximate Length of New Underground Circuit Components	4.88 miles
Existing Overhead Removal	
Moraga–Oakland X 115 kV Circuit 1 (existing northern line, TN27A to Oakland X Substation)	1.13 miles
Moraga–Oakland X 115 kV Circuit 2 (existing northern line, TN27B to Oakland X Substation)	1.13 miles
Moraga–Oakland X 115 kV Circuit 3 (existing southern line, ES30 to Oakland X Substation)	1.20 miles
Moraga–Oakland X 115 kV Circuit 4 (existing southern line, ES30 to Oakland X Substation)	1.20 miles
Total Approximate Length of Existing Overhead Circuit Removed and Not Replaced	4.66 miles

ES = existing structure southern line
RN = rebuild structure northern line
RS = rebuild structure southern line

The proposed rebuild design includes structure type, height, and foundation type changes from the existing design. Design changes reflect the current regulatory requirements and industry standards for new structures. Some structures in both double-circuit lines have been replaced within the last 10 years and will be reused with some modification. The proposed conductor type is a larger size than the existing conductor to accommodate reasonably foreseeable regional load growth and will require structures to be approximately 5 to 10 feet taller to hold the heavier conductor.

The proposed design includes removing and not replacing some existing double-circuit power line structures. These structures are referred to as "interset" structures when the structures to either side are replaced. Proposed structure height changes on this project also typically occur where adjacent interset structures are removed, electromagnetic field (EMF[3]) mitigation is applied, or the rebuilt structure elevation differs. Proposed structures are taller to achieve requisite distance between the conductor and the ground where adjacent structures are removed. The replaced overhead double-circuit power line structures in the central section and in the western section are 10 feet taller than the required design with the implementation of EMF mitigation. In addition, elevation changes between the existing structure locations and the proposed structure locations contribute to a net height change of a replaced structure. Existing residential structures within and adjacent to the power lines alignment and geological conditions and considerations to minimize potential environmental impact, given the hilly terrain and safe access, limit the reasonably feasible power line structure rebuild locations within the alignment.

Structure and foundation type primarily were informed by construction access constraints. For example, LSPs and micropile foundations primarily are proposed for locations where the larger LST or TSP will not fit, or where there is not ground access for a drill rig and a helicopter or a crane will lift equipment or structure pieces to and from the work area. Construction helicopter activity is anticipated to occur only in the eastern section of the project.

The existing Moraga–Oakland X 115 kV lines are supported on 75 existing structures. In total, the existing structures include 67 LSTs, 4 LSPs, 3 TSPs, and 1 LDSP. Existing structures currently range from approximately 53 to 142 feet tall. Of these 75 structures, 45 will be replaced with new structures; 8 will be reused with some modifications; and 22 will be removed and not replaced either through design changes that require fewer supporting structures or through relocating the circuits underground. Five of the seven transition structures will be in a new structure location. Typical design detail for the expected overhead line structure types is shown on Figures 3.3-3a, 3.3-3b, 3.3-3c, and 3.3-3d. Refer to Figures 3.3-4a, 3.3-4b, and 3.3-4c for typical design detail for transition structure types. Figure 3.3-5 provides example single-circuit and double-circuit transition structure images. Refer to Table 3.3-4 for anticipated structure replacement, reuse, and removal details. Table 3.3-4 shows the changes in the heights of the structures and the changes in elevations of the structure bases. The table also shows the net change in height based on the structure height and elevation changes in both feet and percent change from the existing structure height. The table also indicates which structures have a height increase from EMF residential mitigation and to accommodate removal of adjacent structures.

[3] Recognizing that there is public interest and concern regarding potential health effects from exposure to electric and magnetic fields (EMF) from power lines, this document provides some general background information in Appendix 4 regarding EMF. The CPUC has repeatedly recognized that EMF is not an environmental impact to be analyzed in the context of CEQA because (1) there is no agreement among scientists that EMF creates a potential health risk, and (2) there are no defined or adopted CEQA standards for defining health risk from EMF. Refer to, for example, CPUC Decision No. 04-07-027 (July 16, 2004); Delta DPA Capacity Increase Substation Project Final Mitigated Negative Declaration and Supporting Initial Study (November 2006), A.05-06-022, Section B.1.14.1, page B-31, adopted in Decision 07-03-009 (March 1, 2007).

Section X(A) of the CPUC's General Order 131-D, CPUC Decision No. D.06-01-042 ("EMF Decision"), and PG&E's EMF Design Guidelines prepared in accordance with the EMF Decision, require PG&E to prepare a Field Management Plan that indicates the no-cost and low-cost EMF measures that will be installed as part of the final engineering design for the project. The Field Management Plan will evaluate the no-cost and low-cost measures considered for the project, the measures adopted, and reasons that certain measures were not adopted. A copy of the Preliminary EMF Management Plan for this project will be included as an exhibit to the project Application provided to the CPUC.

Table 3.3-4. Double-Circuit Line Structure Components Upgrade, Approximate Metrics

Existing Number	New Number	Existing Type	Proposed Structure, Foundation[a] Type	Existing Height (feet)	Proposed Height (feet)	Structure Height Change (feet)	EMF Residential Mitigation (feet)	Adjacent Removal Increased Structure Height	Structure Elevation Change (feet)	Net Height Change[b] (feet)	Net Percent Height Change[c]
Circuits 1 & 2 Northern Line											
EN1	RN1	LST CH-DE	LST 2D-DE, 4-CP	84	88	4	None	No	2	5	6%
EN2	RN2	LST AH	LST 2B-SUSP, 4-CP	94	112	18	None	No	0	18	19%
EN3	RN3	LST CH-DE	LST 2D-DE, 4-CP	102	93	-9	None	No	-16	-24	-24%
EN4	RN4	LST 2D-DE	Use Existing	111	-	-	-	-	-	-	-
EN5	RN5	LST 2B-SUSP	Use Existing	90	-	-	-	-	-	-	-
EN6	RN6	LST 2D-DE	Use Existing	80	-	-	-	-	-	-	-
EN7	RN7	LST SP ANG DE	LST 2D-DE, 4-CP	73	80	7	n/a	No	3	10	13%
EN8	RN8	LST 37 DEG ANG	TSP V2S-G, CP	75	86	11	n/a	No	-8	4	5%
EN9	RN9	LST ANCHOR	LST 2D-DE, MP	70	79	10	n/a	No	2	12	17%
EN10	RN10	LST SP. ANG.	TSP V2D-G, CP	74	136	62	10	Yes	-4	59	80%
EN11	-	TSP V2D-G	Remove	61	-	-	-	-	-	-	-
EN11A	-	LSP	Remove	71	-	-	-	-	-	-	-
EN12	RN11	LST STD	LSP-SUSP, MP	72	133	61	10	Yes	4	64	89%
EN13	RN12	LST TRANSP DE	TSP V2D-G, MP	67	81	14	10	No	-5	9	14%
EN14	RN13	LST STD	TSP V2S-G, MP	74	86	12	10	No	-2	10	13%
EN15	RN14	LST STD	TSP V2S-G, MP	71	86	15	10	No	2	17	24%
EN16	RN15	LST STD	LSP-SUSP, MP	73	133	60	10	No	-6	54	74%
EN17	RN16	LST STD	LSP-SUSP, MP	72	93	21	10	Yes	-4	18	25%
EN17A	-	LSP	Remove	75	-	-	-	-	-	-	-
EN18	RN17	LST SP ANG DE	TSP V2D-G, MP	72	112	41	10	Yes	14	54	29%
EN19	RN18	TSP V2D-G	Use Existing[d]	134	168	34	10	Yes	0	34	25%
EN20	-	LSP	Remove	77	-	-	-	-	-	-	-
EN21	RN19	LST STD	LSP-SUSP, MP	98	133	35	10	Yes	1	36	36%
EN22	RN20	LST STD	TSP V2D-G, MP	75	81	6	10	No	7	12	16%

Table 3.3-4. Double-Circuit Line Structure Components Upgrade, Approximate Metrics

Existing Number	New Number	Existing Type	Proposed Structure, Foundation[a] Type	Existing Height (feet)	Proposed Height (feet)	Structure Height Change (feet)	EMF Residential Mitigation (feet)	Adjacent Removal Increased Structure Height	Structure Elevation Change (feet)	Net Height Change[b] (feet)	Net Percent Height Change[c]
EN23	RN21	LST STD	TSP V2D-G, CP	72	91	19	10	No	1	20	27%
EN24	RN22	LST 37 DEG ANG	TSP V2D-G-C, CP	77	96	19	10	No	-1	19	11%
EN25	RN23	LST STD	LSP-SUSP, MP	78	93	15	10	No	8	23	30%
EN26	RN24	LST STD	LSP-SUSP, MP	78	83	5	10	No	2	7	9%
EN27	RN25	LST STD	LSP-SUSP, MP	77	83	6	10	No	2	8	10%
EN28	RN26	LST SP ANG DE	TSP V2D-G, MP	122	122	0	10	No	-4	-4	-3%
EN29[e]	TN27A	LST STD	TSP SC-RISER, CP	76	96	20	10	No	2	22	29%
ES31[f]	TN27B	LST STD	TSP SC-RISER, CP	75	96	20	10	No	1	23	27%
EN30	NA	LST STD	Remove	74	-	-	-	-	-	-74	-
EN31	NA	LST SP ANG DE	Remove	85	-	-	-	-	-	-85	-
EN32	NA	LST STD	Remove	74	-	-	-	-	-	-74	-
EN33	NA	LST STD	Remove	71	-	-	-	-	-	-71	-
EN34	NA	LST 37 DEG ANG DE	Remove	73	-	-	-	-	-	-73	-
EN35	NA	LST 37 DEG ANG DE	Remove	72	-	-	-	-	-	-72	-
EN36	NA	LST 37 DEG ANG DE	Remove	71	-	-	-	-	-	-71	-
EN37	NA	LST 37 DEG ANG DE	Remove	72	-	-	-	-	-	-72	-
-	TN28	-	Double-Circuit H-Frame TSP, CP	-	63	-	-	-	-	63	-
	TN29	-	Double-Circuit H-Frame TSP, CP	-	68	-	-	-	-	68	-
Circuits 3 & 4 Southern Line											
ES1	RS1	LST 2C-DE	LST 2D-DE, 4-CP	85	90	5	No	No	0	5	6%
ES2	RS2	LST 2B-SUSP	LST 2B-SUSP, 4-CP	111	110	-1	No	No	-7	-8	-7%
ES3	RS3	LST 2C-DE	LST 2D-DE, 4-CP	80	85	5	No	No	6	11	14%
ES5[g]	RS4	LST 2D-DE	Use Existing	114	-	-	-	-	-	-	-
ES6	RS5	LST 2B-SUSP	Use Existing	112	-	-	-	-	-	-	-
ES7	RS6	LST 2D-DE	Use Existing	82	-	-	-	-	-	-	-

Table 3.3-4. Double-Circuit Line Structure Components Upgrade, Approximate Metrics

Existing Number	New Number	Existing Type	Proposed Structure, Foundation[a] Type	Existing Height (feet)	Proposed Height (feet)	Structure Height Change (feet)	EMF Residential Mitigation (feet)	Adjacent Removal Increased Structure Height	Structure Elevation Change (feet)	Net Height Change[b] (feet)	Net Percent Height Change[c]
ES8	RS7	LST 37 DEG ANG	LST 2D-DE, 4-CP	74	78	4	No	No	-1	3	4%
ES8A&B	-	3HP	Remove	53	-	-	-	-	-	-	-
ES9	RS8	LST STD	TSP V2S-G, CP	72	101	29	No	Yes	2	31	42%
ES10	RS9	LST STD	LST 2D-DE, MP	71	77	6	No	No	2	8	11%
ES11	RS10	LST STD	TSP V2D-G, CP	75	126	51	10	Yes	-1	50	67%
ES12	-	LST SP ANG DE	Remove	73	-	-	-	-	-	-	-
ES13[g]	RS11	LSP	LSP-SUSP, MP	77	118	42	10	Yes	-7	35	45%
ES15	RS12	STD-DE	TSP V2D-G, MP	68	81	13	10	No	2	15	21%
ES16	RS13	LST STD	TSP V2S-G, MP	75	91	16	10	No	3	20	26%
ES17	RS14	LST STD	TSP V2S-G, MP	75	86	11	10	No	3	14	18%
ES18	RS15	LST STD	LSP-SUSP, MP	73	133	60	10	No	1	61	84%
ES19	RS16	LST STD	LSP-SUSP, MP	73	93	20	10	No	3	23	32%
ES20	RS17	LST SP ANG DE	TSP V2D-G, MP	72	91	19	10	No	6	26	6%
ES21	RS18	TSP V2D-G	Use Existing[g]	109	158	50	10	Yes	0	49	46%
ES22	-	LSP	Remove	72	-	-	-	-	-	-	-
ES23	RS19	LST STD	LSP-SUSP, MP	100	118	19	10	Yes	-1	18	18%
ES24	RS20	LST STD	TSP V2D-G, MP	75	81	6	10	No	6	12	16%
ES25	RS21	LST STD	TSP V2D-G, CP	75	86	11	10	No	1	12	16%
ES26[e]	RS22	LST 37 DEG ANG DE	TSP V2D-G, CP	84	116	32	10	No	4	37	44%
ES27	RS23	LST STD	LSP-SUSP, MP	78	93	16	10	No	-1	15	19%
ES28	RS24	LST STD	LSP-SUSP, MP	78	83	5	10	No	-2	3	4%
ES29	RS25	LST STD	LSP-SUSP, MP	77	88	11	10	No	-3	8	10%
ES30	RS26	LST SP ANG DE	TSP V2D-G, MP	142	92	-50	10	No	6	-44	-31%
ES31	TN27B[h]	LST STD	Refer to Table 3.3-4	75	-	-	-	-	-	-	-
-	TS27A	LST STD	TSP SC-RISER, CP	-	81	New	10	No	-	84	38%

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Table 3.3-4. Double-Circuit Line Structure Components Upgrade, Approximate Metrics

Existing Number	New Number	Existing Type	Proposed Structure, Foundation[a] Type	Existing Height (feet)	Proposed Height (feet)	Structure Height Change (feet)	EMF Residential Mitigation (feet)	Adjacent Removal Increased Structure Height	Structure Elevation Change (feet)	Net Height Change[b] (feet)	Net Percent Height Change[c]
-	TS27B	LST STD	TSP SC-RISER, CP	-	81	New	10	No	-	81	38%
ES32	NA	LST STD	Remove	76	-	-	-		-	-	-
ES33	NA	LST SP ANG DE	Remove	84	-	-	-		-	-	-
ES34	NA	LST STD	Remove	71.5	-	-	-		-	-	-
ES35	NA	LST SP ANG DE	Remove	84	-	-	-		-	-	-
ES36	NA	LST SP ANG DE	Remove	75	-	-	-		-	-	-
ES37	NA	LST SP ANG DE	Remove	71	-	-	-		-	-	-
ES38	NA	LST SP ANG DE	Remove	74	-	-	-		-	-	-
-	TS28	-	Vertical Double-Circuit TSP, CP	-	66	New	10	No	-	66	

[a] Foundation types: CP = Concrete Pier - Pole; 4-CP = Concrete Pier - Tower; MP = Micropile

[b] Net Height Change calculates the difference between the elevation and height of the existing structure and the elevation and height of the proposed structure. It is determined by adding the change in structure height and the change in structure elevation. Structure heights, elevations, and net changes shown in the table have been rounded to the nearest whole number. As a result, the number shown in the net change column may be 1 foot more or less than the sum of the changes in structure height and elevation show in each row.

[c] Net Percent Height Change calculates the difference between both the proposed structure height with any elevation change and existing structure height. The difference is divided by the existing structure height.

[d] Existing foundation and lower portion of structure to remain in place with modification to upper portion. Top section of steel pole to be replaced to increase height and add OPGW/shield wire crossarms.

[e] Existing AT&T antennas will be relocated by AT&T.

[f] Structure TS27B will effectively replace ES31 in location but will support Circuit 2 instead of Circuits 3 and 4. ES31 is also listed as part of the southern line.

[g] There is no existing structure ES4 or existing structure ES14.

[h] TN27B is a structure support for Circuit 2.

2B = tangent structure type
2D = two double circuits on a D type tower
AH = a type of structure identified by AH
ANCHOR = a structure with more anchoring function in its foundation
ANG = angle
CH = a type of structure identified by CH
D or DE = deadend
DEG = degree
EN = existing structure northern line
ES = existing structure southern line
HP = horizontal post
LDSP = light duty steel pole
LSP = lattice steel pole
LST = lattice steel tower
NA = not applicable
RN = replaced structure northern line
RS = replaced structure southern line
SC = single circuit
SP = special
STD = standard
SUSP = suspension
TN = new transition (riser) structure northern line
TRANSP = transposition
TS = new transition (riser) structure southern line
TSP = tubular steel pole
V2D-G = vertically framed, double circuit, deadend steel pole with gull arms

Existing steel structures range from approximately 61 to 142 feet tall, with the LDSP at approximately 53 feet tall. Replacement structures and single-circuit transition structures will range from approximately 76 to 168 feet tall. Double-circuit transition structures on Oakland X Substation property will be approximately 63 to 68 feet tall.

Structures will be shifted from the existing centerline within the alignment to allow the replacement structure to be safely constructed or to support safe construction, operation, and maintenance access. In most cases, replacement is anticipated to be within approximately 10 to 80 feet from the existing structures' locations. Replaced structures on the northern and the southern lines typically will be spaced at least 55 feet apart to meet current standards.

Removal of structures and wires that are not being replaced is discussed in Section 3.3.3.3. Exact heights will depend on span lengths and ground clearance requirements, which change with land uses (such as open space, vegetation, residential development, roadways, and highways), topography, electrical clearances, and other design considerations. Exact structure type, configuration, and dimensions will be determined by CPUC requirements, final engineering, and other factors and are subject to change.

Replacement structures will include LSTs, LSPs, TSPs, and transition structure types. Refer to Figures 3.3-3a, 3.3-3b and 3.3-3c for typical LST, LSP, and TSP, including a preliminary design for a modified TSP. Existing LSTs have a base width of approximately 15 to 25 feet. Existing LSPs are approximately 4.5 feet in diameter at the base. Existing TSPs are approximately 6 feet in diameter at the base. Replaced LST, LSP, and TSP footprints will be approximately 16 to 28 feet wide, approximately 4.5 feet in diameter, and approximately 6 feet in diameter, respectively. LSTs will have four concrete pier-type foundations. Two TSP foundations are expected to be reused; the top sections of these poles will be replaced on the current foundations with TSPs of the appropriate design for the upgraded lines. Replaced LSP and TSP foundations will be either a series of micropile caissons with a pile cap, or a single drilled-shaft reinforced concrete caisson. Embedded steel foundation types will be designed with consideration of corrosion potential over the design life of the structure. Transition structures will use a TSP type with double-circuit transition structures using a vertical TSP or with H-cross framing between each TSP.

Currently, three arms extend approximately 6.5 to 7 feet from either side of existing structures. Arms on replaced structures will extend approximately 7 feet from each side on TSPs, LSTs, and LSPs. The arm modification is the minor modification expected for to reuse the recently replaced LSTs (EN4, EN5, EN6, ES5, ES4, and ES6). The TSPs have an additional small arm on each side for OPGW (the communication line between substations for the operation of the lines). Vertically, arms (and conductors suspended from the arms) are approximately 10 feet apart for TSPs, LSTs, and LSPs. The new structures will meet current raptor safety requirements. Some existing structures have PG&E meteorological equipment including small antennas, powered by a small solar panel, attached mid-structure. The small attachment likely will be moved to the rebuilt power line structure or other existing PG&E facility as needed. Existing structures are galvanized and dull gray or green in color, except for two of the existing TSPs (EN19 and ES21) that are Corten steel and are dark brown in color. The replaced top sections of EN19 and ES21 will be Corten steel. Other replacement structures typically will be galvanized steel and are expected to weather to a dull gray patina in 2 to 5 years.

The existing conductor is 3/0 7 Strand MHD copper, with two exceptions. Between structures EN3 and EN6 on Circuits 1 and 2 and structures ES3 and ES7 on Circuits 3 and 4, a 397.5 all-aluminum conductor (AAC) is used. A 715 AAC is used between Moraga Substation and ES3 on Circuits 3 and 4. The existing conductor types will be replaced with a 3M 477-T13 "Flicker" ACCR-TW conductor with a non-specular finish. Insulators will be hung in an I-string configuration. In total, approximately 20 circuit miles of existing conductor (5 miles per circuit) will be removed, with approximately 14.5 circuit miles being replaced with new conductor as part of the rebuilt overhead portion. An OPGW and static steel ground wire will be added in a top cable position above the phase conductors where the lines are remaining overhead. The OPGW will augment the existing communication system between Moraga and Oakland X substations.

Existing spans have an average span length of approximately 670 feet and a range of approximately 130 to 1,740 feet. Rebuilt spans are expected to have an average span length of approximately 750 feet and a range of approximately 100 to 1,770 feet. Longer or shorter spans may be required in certain locations during final design. The overhead spans into Moraga Substation will be reconductored. The minimum ground conductor clearance (MGCC) will be designed in accordance with PG&E's Overhead Transmission Line Design Criteria (Document 068177, revision 15); the applicable criterion specifies an MGCC of 28 feet when the wire is at emergency conditions (464 degrees Fahrenheit [°F]) and 31 feet at normal conditions (60°F). The PG&E design standard for MGCC includes the 30 feet, as specified in GO 95, for normal clearance. In some conditions, the designed conductor ground clearance will exceed the minimum.

Seven transition structures, between the overhead and underground portions of the line, will be installed as part of the power line rebuild. Two transition structures will be installed northwest of the intersection of Park Boulevard and Estates Drive to route Circuits 1 and 2 on the northern line underground. These two single-circuit transition structures will be located to the west of the existing structures and will replace the existing two double-circuit power line structures near Estates Drive. Two single-circuit transition structures will be installed south of Park Boulevard at Estates Drive to route Circuits 3 and 4 on the southern line underground. These two single-circuit transition structures will be located to the west of the double-circuit ES30 and new single-circuit spans will connect the replacement double-circuit RS26 to the southern single-circuit transition structures, TS27A and TS27B. The four transition structures near Estates Drive and Park Boulevard will be single-circuit tubular steel poles (refer to Figure 3.3-4a). The three transition structures near Park Boulevard Way on the east side of Oakland X Substation are double-circuit tubular steel poles with either a vertical or H-frame configuration (refer to Figures 3.3-4b and 3.3-4c). These double-circuit transition structures will be on substation property approximately 100 feet west of EN37 and ES38.

3.3.3.2 Underground Relocation

Preliminary design cross sections of underground duct banks with telecommunication facilities are shown on Figure 3.3-6. Details of underground vaults are provided on Figure 3.3-7.

The underground component of the rebuilt power lines will include installation of vaults, duct banks, and a cable system in city streets through open trench construction. Table 3.3-3 summarizes the underground relocation segments and Figure 3.2-1 and Figure 3.5-1 show the location of the underground portion. Circuits 1 and 2, from the northern overhead line, will transition to underground from their respective transition structures near the intersection of Estates Drive and Park Boulevard. These circuits will continue in one double duct bank in Estates Drive, Park Boulevard, and Park Boulevard Way to Oakland X Substation. Circuits 3 and 4, on the southern overhead line, will transition to underground from their respective transition structures on the south side of Park Boulevard near Estates Drive. These circuits will continue in one double duct bank in Park Boulevard and Park Boulevard Way, on the other side of the roadway from Circuits 1 and 2, toward Oakland X Substation. Transition structures on substation property will raise the underground lines to the existing connection points on the east side of the substation building.

Each of the two duct banks will use 10-inch DR11 (DR = dimension ratio when dividing the average outside diameter of the pipe by the minimum pipe wall thickness) high-density polyethylene (HDPE) conduits, one for each circuit. Each duct bank typically will be approximately 4 feet wide. The conduits will be placed on sandbags and will be encased in a thermal concrete casing at least 1.5 feet thick. The concrete casing will be covered by a non-bonding agent/barrier and will be a minimum of 3 feet below the road surface. The space between the agent/barrier and the road surface will consist of a fluidized thermal backfill. Fiber optic lines (expected to be a 72-strand fiber cable) for system protection and telecommunication will be installed in two 4-inch-diameter DR11 HDPE conduits within each duct bank and between the two electric conduits. The underground 115 kV cable will be copper cross-linked polyethylene (XLPE) triplex type, consisting of three XLPE-insulated copper conductors, one conductor per phase, manufactured in a helical, unitized construction with integrated ground continuity conductor and distributed temperature-sensing fiber optics. Two 115 kV circuits' cables will be spliced in each

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vault. To support safety for ongoing splice vault maintenance and system repair conducted in or from splice vaults, cable splices will be constructed inside of explosion-proof housings.

A typical cross section of a duct bank is shown on Figure 3.3-6. Typical dimensions may vary depending on soil stability and the presence of existing substructures. Depending on the existing facilities within the roadway, the duct bank may require transitioning to a vertical or horizontal arrangement to maintain clearance from other existing facilities. A final determination on the need to relocate utilities will be made during final engineering. Localized underground utilities will be identified during final design and will either be avoided or be relocated in coordination with the utility owner.

Vaults (approximately 22 feet by 12 feet and 10 feet tall) are located where sections of the underground cable line lengths are pulled through the duct banks and spliced together during construction. Details of a typical vault are shown on Figure 3.3-7. Vaults are used to access the line for typical operations and maintenance. Average spacing of vaults is expected to be approximately 1,250 feet or less. The first vault downstream of a line's transition structure will be located within approximately 200 feet of a line's transition structure. Approximately, 5 to 10 vaults are expected to be installed to connect the cable lengths in each duct bank. The duct banks will widen to approximately 5.5 feet on the approach to and departure from the vaults. The vaults will be precast concrete and will be placed on a crushed aggregate base. A telecommunication vault (approximately 4 feet wide by 6 feet long and at least 3 feet deep) will be installed within approximately 40 feet of each power line vault.

When installed, the duct bank will be under the surface of the restored roadway and will not be visible. Each of the power line vaults will have three utility access covers that are level with the adjacent road surface. An illustration of the utility cover is shown on Figure 3.3-7. The vault access covers are expected to be cast iron and have an approximate 39-inch diameter. Each telecommunication vault or box will be accessed by opening the box cover made of two aluminum lids that are installed level with the adjacent road surface. Final design will determine the size of the telecommunication lids, which typically cover approximately 5 to 6 inches beyond the telecommunication box dimensions.

3.3.3.3 Overhead Removal

When existing overhead power line components are no longer needed, the conductors will be removed from the existing structures one span at a time, and then existing structures will be removed. Approximately 4.66 circuit miles (1.13 to 1.20 miles per circuit) will be removed where the power line is replaced underground as listed in Table 3.3-3. Approximately 22 existing structures will be removed and not replaced as listed in Table 3.3-4. No existing structures are expected to be abandoned in place. Foundation reveals and up to 3 feet below grade are expected to be removed in coordination with landowner preference. Direct-bury poles will be removed entirely. Replaced overhead line components will be removed because they will no longer be needed to operate the power line and if they remain then they could conflict with the operation of the rebuilt power line or become a hazard.

3.3.3.4 Substation Upgrades

The permanent fenced areas of Moraga and Oakland X substations, approximately 1.31 acres and approximately 15.80 acres, respectively, will not change as part of the proposed project. The location of the substations is shown on Figure 3.1-1 and Figure 3.5-1.

Upgrades at Moraga and Oakland X substations are needed to align with the connecting rebuilt lines. Modification is expected to include replacing 115 kV substation components and updating system protection schemes, including telecommunication upgrades. No building or enclosure modification are anticipated at either substation. Fencelines may need to be temporarily removed to facilitate safe construction and will be replaced in the same location.

Moraga Substation. Two 115 kV air disconnect switches and two 115 kV circuit breakers at Moraga Substation are expected to require replacement at the time of construction. Air disconnect switches open or close an electrical circuit by disconnecting or connecting the circuits in the air. The existing air switches are each rated for approximately 2,000 amps and will be replaced with circuit breakers with the same rating. The existing circuit breakers are each rated for approximately 3,000 amps and will be replaced with circuit breakers with the same rating. Circuit breakers safely control the flow of energy at all voltage levels across a grid by switching electrical currents on and off using mechanical switching devices. When switched to an open position, breakers use insulation to cut currents immediately. When switched to a closed position, breakers ensure optimal current flow. Types of circuit breakers differ based on the method used to extinguish electrical arcs and interrupt current. The two existing circuit breakers connecting to the project lines use oil or sodium hexafluoride (SF_6).

One circuit breaker is insulated with pure mineral oil (approximately 3,450 gallons) and the other circuit breaker is insulated with SF_6 gas (approximately 132 pounds (lbs)). Both existing circuit breakers will be replaced with SF_6 insulated breaker (each with approximately 132 lbs of SF_6) that will accommodate the higher conductor rating capacity. The higher rating will align with standards at the time of construction and may require breaker foundations to be replaced at that time. No modifications to the existing Moraga Substation fenceline are planned. The system protection scheme for the lines will be reviewed and likely replaced in kind within the control enclosure of Moraga Substation. The two SW and the two OPGW (one on each double-circuit power line) will be terminated in the substation. The existing substation telecommunication equipment will be modified within the control enclosure to connect with the OPGW communication path installed on the rebuilt lines. The overhead spans into Moraga Substation from RN1 and RS1 will be reconductored.

Oakland X Substation. Oakland X Substation's 115 kV bus components associated with the project lines, three 115 kV circuit breakers and one 115 kV bus, within the substation building are expected to be replaced. The circuit breakers are each rated for approximately 2,000 amps and will be replaced with circuit breakers with the same rating. The bus is rated for approximately 703 amps and will be replaced with a bus rated at approximately 1,181 amps. The higher bus rating will be installed to align with the replaced conductor at 1,212 amps. No building modification is planned. The system protection scheme will be reviewed for the lines and likely replaced in kind within the control room of Oakland X Substation. The existing substations' telecommunications equipment will be modified within the substation control area to connect with the communication path installed with the hybrid lines. No modifications outside of or to the existing Oakland X Substation fenceline are planned. The four existing external Moraga–Oakland X 115 kV line connections will be disconnected from EN37 and ES38 and connected to the rebuilt hybrid lines from the new transition structures, TN28 and TS29.

3.3.3.5 Third-Party Communication Facilities

The mobile phone antennas attached to the lower sections of ES26 and EN29 will be relocated by AT&T to its own facility. The antennas need to be removed because the structures they are attached to are being replaced. PG&E will arrange with AT&T to relocate their equipment from ES26 and from EN29.

3.3.4 Proposed Facilities

No new facilities are proposed as part of the project.

3.3.5 Other Potentially Required Facilities

The project does not anticipate the need to relocate (temporary or permanent), modify, or replace unconnected utilities or other types of infrastructure by PG&E or any other entity.

PG&E has completed notification of the Federal Aviation Administration (FAA) concerning the expected heights of its rebuilt 115 kV structures. No lighting or marking is required by FAA. Refer to Appendix F2.

The project does not anticipate requiring civil engineering requirements to address site conditions or slope stabilization issues, such as pads and retaining walls.

3.3.6 Future Expansions and Equipment Lifespans

There are no current or reasonably foreseeable plans for expansion or future phases of development.

Substation facility life is indefinite. Substations typically have room for future expansions depending on future capacity increase or reliability needs. Substation and power line structures and foundations have a typical lifespan of approximately 75 years. Major power components within a substation typically have a lifespan of approximately 20 years. Power line conductors/cables typically have a lifespan of approximately 50 years.

3.3.7 Belowground Conductor/Cable Installations

Descriptions of belowground conductors/cable installations are provided in Section 3.3.3.2, including the type of power line to be installed, the casing type and dimensions, and the associated infrastructure in the duct bank.

3.3.8 Electric Substations

No transformer banks will be added or modified as part of the project. Two existing 115 kV circuit breakers at Moraga Substation are expected to be replaced. The circuit breakers are each rated for approximately 3,000 amps and will be replaced with circuit breakers with the same rating. One existing oil-insulated 115 kV circuit breaker is expected to be replaced with a gas-insulated 115 kV circuit breaker, and an existing 115 kV gas-insulated circuit breaker will be replaced in kind. PG&E may use a different technology for the SF_6 breakers within substations if, during final design, available technology will allow a reduction in additional SF_6 use. The potential change in technology is expected to have the approximate physical dimensions of the current circuit breaker technology. Two existing 115 kV air switches at Moraga Substation are expected to be replaced. The air switches are each rated for approximately 2,000 amps and will be replaced with circuit breakers with the same rating The existing substation telecommunication equipment will be modified within the control enclosure to connect with the OPGW communication path installed on the rebuilt lines. The potential new technology is expected be able to be installed within the substation fencelines and have negligible operational differences from the current circuit breaker technology, other than the potential reduction in SF_6 use. No modifications to the existing Moraga Substation fenceline are planned.

Oakland X Substation's 115 kV bus components associated with the project lines, three 115 kV circuit breakers and one 115 kV bus, within the substation building are expected to be replaced. The circuit breakers are each rated for approximately 2,000 amps and will be replaced with circuit breakers with the same rating. The bus is rated for approximately 703 amps and will be replaced with a bus rated at approximately 1,181 amps. The higher bus rating will be installed to align with the replaced conductor at 1,212 amps. The existing substations telecommunications equipment will be modified within the substation control area to connect with the communication path installed with the hybrid lines. No building modification is planned. No modifications outside of or to the existing Oakland X Substation fenceline are planned.

No new operation and maintenance facilities, telecommunications equipment, and SCADA equipment will be installed within the substations. The existing substations' telecommunications equipment will be modified within the substation control area to connect with the communication path installed with the hybrid lines.

3.3.9 Telecommunication Lines

The rebuild will include installation of new OPGW on the top set of crossarms of the rebuilt overhead structures with a communication path continuing within the underground portions. No separate telecommunication facilities are anticipated. Each of the new double-circuit lines will be strung with one OPGW and one 7#8 Alumoweld shield wire on wire crossarms. Approximately 15.74 miles of wire will be installed on the overhead rebuild portion. Refer to Section 3.3.3.1 for additional discussion of aboveground communication facilities. The communication path will continue within the underground portion being located within a telecommunication conduit in each double duct bank. Approximately 4.88 miles of a 72-strand fiber optic cable is expected to be installed in the underground rebuild portion. Telecommunication vaults will be installed near each underground power line vault providing communication access isolated from the high-voltage power lines. Depth of the telecommunication duct bank and vaults is expected to be similar when colocated in the power line duct bank. Refer to Section 3.3.3.2 for additional discussion of underground communication facilities.

Some existing structures have PG&E meteorological equipment including small antennas, powered by a small solar panel, attached mid-structure. This equipment is not directly associated with the power line operation and may be replaced or relocated at the time of construction depending on PG&E needs at that time.

3.4 Land Ownership, Rights-of-Way, and Easements

3.4.1 Land Ownership

Where the lines are not located on property owned in fee by PG&E or existing rights are not sufficient to accommodate the rebuilt power lines, then perfected, modified, or new rights-of-way (ROW) and other land rights will be required. Project work at Moraga and Oakland X substations will occur within the existing substation properties, which are owned in fee by PG&E. The new transition structures outside of Oakland X Substation will be located on existing PG&E property that is adjacent to Park Boulevard Way, where the underground lines will transition between franchise and substation property.

The existing power line structures are expected to be replaced mainly within the existing easements and near existing structure locations in most cases. Transition structures are expected to be located on PG&E property or as a new easement on City of Oakland property. Underground portions are expected to be placed in city-owned roadways per a franchise agreement with the City of Piedmont and the City of Oakland, respectively, where not on PG&E property or City of Oakland easement.

3.4.2 Existing Rights-of-Way or Easements

Project components will be located within PG&E property owned in fee, existing or modified easements, or within franchise. At public roadway crossings, the lines use PG&E franchise agreements with the appropriate local jurisdiction. The lines crossing SR 13 use a Caltrans encroachment agreement.

3.4.3 New or Modified Rights-of-Way or Easements

New and modified permanent easements are expected to be required at the approximate locations shown in Table 3.4-1. New or modified easements are needed to rebuild the lines to standards such as structure relocations, blow out of the conductor at high wind conditions and for the single new span to transition structures along Park Boulevard near Estates Drive. Existing easement restrictions are expected to be compatible with the proposed rebuild of the overhead lines. Existing easements with private or public entities are anticipated to be perfected. Easement perfection is the process where ongoing terms of easement use in practice are formalized in the easement agreement. Approximately 2 new permanent easements, approximately 43 modified easements, modified use of existing franchise rights in approximately 22 locations, are expected to be acquired or modified, respectively, as described in Table 3.4-1 and shown in Figure 3.4-1.

Table 3.4-1. Existing, Modified and New Land Rights or Easements, Approximate Dimensions

Project Mile Points	Assessor Parcel Number(s) (APN)	Existing Length x Width (Feet)	Expected New or Modified Easement Length x Width (Feet) Description
Existing Alignment			
0.00-0.36	271-010-004-07	PG&E parcel	No change
0.36-0.38	273-290-004-4 273-290-005-1	106 x 40 – each line 106 x 40 – each line	Modified: 106 x 160 – both lines
0.36-0.50	273-290-004-5 273-290-005-1	739 x 100	Modified: 739 x 92
0.50-0.77	257-010-007-9	1426 x 75	Modified: 1426 x 128
0.77-1.00	257-010-006-1	1214 x 100	Modified: 1224 x 115
1.00-1.07	257-010-006-1	370 x 75	Modified: 370 x 244
1.07-1.38	257-010-006-1	1637 x 100	Modified: 1637 x 340
1.38-1.43	State of California	264 x 100	Modified: 264 x 86 (Pinehurst Road crossing)
1.43-1.63	257-020-005	PG&E	No change
1.63-1.65	Contra Costa County	106 x 60	Modified: 106 x 86 (Manzanita Drive crossing)
1.64-1.65	048E-7320-085-01	53 x 60	Modified: 53 x 89
1.65-1.74	048E-7320-087	PG&E	no change
1.74-1.75	City of Oakland	53 x 60	Modified: 53 x 86 (Skyline Boulevard crossing)
1.75-1.81	048E-7321-048-03	317 x metes & bounds	Modified: 317 x 86
1.81-1.82	City of Oakland	53 x 60	Modified: 53 x 134 (Arrowhead Drive crossing)
1.82-1.94	048E-7325-095 048E-7325-096	PG&E	no change
1.90-1.95	City of Oakland	211 x 60	Modified: 211 x 144 (Pathway from East Circle to Gunn Drive and Gunn Drive crossing)
1.95-1.96	048E-7326-029	PG&E	no change
1.96-1.97	City of Oakland	53 x 60	Modified: 53 x 144 (Saroni Drive crossing)
1.97-2.06	048E-7328-6-1	475 x 60	Modified: 475 x 144
	048E-7328-54		
	048E-7328-51		
	048E-7348-13		
	048E-7328-12		
	048E-7328-8-1		
2.08	City of Oakland	53 x 60	Modified: 53 x 96 (Sayre Drive crossing)
2.08	048E-7330-081	PG&E	no change
2.09	City of Oakland	53 x 60	Modified: 53 x 96 (Pathway from Azalea Lane to Sayre Drive crossing)
2.09-2.10	048E-7330-082	PG&E	no change
2.10-2.11	City of Oakland	53 x 60	Modified: 53 x 96 (Sayre Drive crossing)
2.11-2.14	048E-7328-070 048E-7325-095	PG&E	no change
2.14-2.15	City of Oakland 048E-7330-26	53 x 60	Modified: 53 x 96 (Sayre Drive crossing)
2.15-2.17	048E-7330-083-03	Metes & Bounds	Modified: 105 x 96
2.17-2.28	048E-7330-083-02	422 x 110	Modified: 580 x 141

Table 3.4-1. Existing, Modified and New Land Rights or Easements, Approximate Dimensions

Project Mile Points	Assessor Parcel Number(s) (APN)	Existing Length x Width (Feet)	Expected New or Modified Easement Length x Width (Feet) Description
2.21-2.28	048E-7328-068 048E-7328-069	PG&E	no change
2.28-2.29	City of Oakland	53 x 60	Modified: 53 x 141 (Pathway from Sayre Drive to Paso Robles Drive crossing)
2.28-2.29	City of Oakland	53 x 60	Modified: 53 x 141 (Paso Robles Drive crossing)
2.29-2.31	048E-7348-077	PG&E	no change
2.31-2.32	City of Oakland	53 x 60	Modified: 53 x 141 (Balboa Drive crossing)
2.32-2.38	048E-7347-042	PG&E	317 x 141
2.35-2.44	048E-7348-034	475 x 60	Modified: 475 x 143
	048E-7348-039		
	048E-7348-042-4		
	048E-7348-043		
	048E-7347-012		
2.45-2.46	City of Oakland	53 x 60	Modified: 53 x 141 (Balboa Drive crossing)
2.40-2.42	048E-7348-071	Metes & Bounds	Modified: 106 x 143
2.42-2.48	City of Oakland 048E-7348-090	317 x 60	Modified: 317 x 143 (West Circle crossing and non-franchise parcel)
2.48-2.72	048E-7348-075	PG&E	No change
2.70-2.88	City of Oakland	950 x 60	Modified: 950 x 100 (Montclair Railroad Trail)
2.85-2.87	048E-7348-074	106 x 15	Modified: 106 x 43
2.88-2.92	048E-7348-072-1	211 x lot description	Modified: 211 x 90
2.87-2.88	048E-7348-063	53 x 60	Modified: 53 x 60 with additional 325 square feet
2.70-2.91	048E-7348-067 048E-7350-008	1109 x up to 60 or 132 with 78 west of, and 54 east of, centerline	Modified: Existing easement with an additional 12 feet
2.84-2.85	048E-7348-062	53 x at least 60	Modified: 53 x 90
2.83-2.84	048E-7348-061	53 x at least 60	Modified: 53 x at least 60
2.81-2.82	048E-7348-059	53 x at least 60	Modified: 53 x at least 60
2.80-2.81	048E-7348-058-02	53 x at least 60	Modified: 53 x at least 60
2.79-2.80	048E-7348-057-01	53 x at least 60	Modified: 53 x at least 60
2.78-2.79	048E-7348-055	53 x at least 60	Modified: 53 x at least 60
2.74-2.75	048E-7348-053	53 x at least 60	Modified: 53 x at least 60
2.73-2.74	048E-7348-052	53 x at least 60	Modified: 53 x at least 60
2.71-2.73	048E-7348-050 048E-7348-051	106 x at least 60	Modified: 53 x at least 60
2.81-2.82	048E-7348-060	53 x at least 60	Modified: 53 x at least 60
2.91-2.97	City of Oakland	317 x 60	Modified: 317 x 122 (Montclair Railroad Trail crossing)
2.97-3.01	048E-7350-011	PG&E property	No change
3.01-3.02	City of Oakland	53 x 60	Modified: 53 x 122 (Shepherd Canyon Road crossing)

Table 3.4-1. Existing, Modified and New Land Rights or Easements, Approximate Dimensions

Project Mile Points	Assessor Parcel Number(s) (APN)	Existing Length x Width (Feet)	Expected New or Modified Easement Length x Width (Feet) Description
3.02-3.17	048D-7244-012-3	792 x 60	Modified: 792 x 105 (includes Scout Road crossing)
	048D-7244-30		
	048D-7244-12-4		
	City of Oakland		
	048D-7244-29		
3.17-3.24	048D-7234-013	PG&E	No change
3.24-3.35	City of Oakland Caltrans	581 x 60	Modified: 581 x 134 Mountain Blvd and SR 13 crossings
3.35-3.37	029A-1330-030	PG&E	No change
3.37-3.38	City of Oakland	53 x 60	Modified: 53 x 134 (Monterey Blvd crossing)
3.38-3.86	029A-1300-033	PG&E	No change
3.38-3.40	City of Oakland 029A-1330-027-06	106 x Metes & Bounds	Modified: 106 x 79 (Park Boulevard crossing)
3.91-3.93	051-4812-017	PG&E	No change
3.86-3.91	Multiple parcels	264 x 60	No change: overhead removal proposed
3.91-3.93	Multiple parcels 051-4812-011-10	106 x 60	No change: overhead removal proposed
3.93-4.17	Multiple parcels	1267 x 60	No change: overhead removal proposed
4.17-4.28	024-0607-052 024-0607-053	PG&E	No change: overhead removal proposed
4.28-4.30	Multiple parcels	106 x 60	No change: overhead removal proposed
4.30-4.31	024-0608-020-01	PG&E	No change: overhead removal proposed
4.31-4.32	024-0608-061-01	53 x 60	No change: overhead removal proposed
4.32-4.38	024-0608-020-01	PG&E	No change: overhead removal proposed
4.38-4.53	Multiple parcels	792 x 60	No change: overhead removal proposed
4.53-4.54	024-0608-055	PG&E	No change: overhead removal proposed
4.54-5.00	Multiple parcels	2429 x 60	No change: overhead removal proposed
5.00-5.04	Multiple parcels	211 x 50	No change: overhead removal proposed
New Alignment – New Span			
Near 3.38 RN26-TS27A & 27B	029A-1330-12-5	New	New: 100 x 70
	029A-1330-013-01	New	New: 430 x 100

Relocation or demolition of commercial or residential property or structures is not expected.

When the final project alternative is approved by the CPUC, PG&E will finalize design and develop new or modified easement documents for landowner review and negotiation. After PG&E and the landowners come to terms with the easement language and compensation, the document will be signed by both parties and recorded with the Contra Costa or Alameda County Assessor Offices.

The underground portion will be located on PG&E property owned in fee, use existing franchise rights with the City of Oakland or the City of Piedmont, or a new easement from the City of Oakland on Assessor Parcel Number (APN) 029A-1330-013-01. The new connecting overhead span between RS26 and TS27A and TS27B will cross portions of APN 029A-1330-12-5 and APN 029A-1330-013-01. A new PG&E easement, an area of approximately 70 feet by 100 feet and an area of approximately 430 feet by 100 feet, will be requested from the City of Oakland as listed in Table 3.4-1.

3.4.4 Temporary Rights-of-Way or Easements

Temporary construction easements will be required for work areas, access, tension pull sites, potential staging areas, and landing zones/staging areas (LZ/SA) identified on Figure 3.5-1 that are outside of existing PG&E land rights. Most temporary areas and access are expected to be within or adjacent to the existing alignment wherever reasonably feasible. Potential staging areas available at the time of construction are described in Section 3.5.2.

PG&E will acquire the necessary land rights to accommodate all anticipated construction work areas and access associated with the proposed project. PG&E will obtain ministerial encroachment permits to conduct work in public rights-of-way in accordance with municipal requirements. PG&E will rent space or acquire temporary construction easements from private or public landowners to stage materials and equipment during construction.

When the final project alternative is approved by the CPUC, PG&E will finalize design and develop temporary construction easement documents for landowner review and negotiation.

3.5 Construction

The following sections provide a description of the project's construction activities regarding access, staging areas, work areas, site preparation, work activities at project components, management of materials and waste, and other typical construction methods.

3.5.1 Construction Access

Access for construction equipment will be work-location specific along this corridor. Topography and grade within the existing alignment do not allow for continuous linear access by construction equipment or vehicles. The existing access to the overhead lines will serve as the primary construction access.

No new temporary access routes, new permanent access routes or overland access are anticipated for construction or operation and maintenance of the proposed project. Unexpected conditions during construction or operations and maintenance may require additional unplanned access for safety reasons.

3.5.1.1 Existing Access Roads

Most work areas will be accessed directly from adjacent paved roads or existing dirt access roads. Some work areas without a road will be accessed by workers on foot and work area equipment and materials will be placed in the work area by crane or helicopter. Construction helicopter activity is anticipated to occur only in the eastern section of the project. Where the lines are being rebuilt underground in city streets access will be from the paved road itself. The existing network of public and private roads, existing dirt or fire roads and walking paths or trails is expected to be used to access structure work areas, tension pull sites, and staging areas as mapped on Figure 3.5-1. Most of the existing paved roads are public roadways or are on PG&E or private residential property. When not on paved roads, most of the existing access roads for the existing power lines are double-track dirt roads. These fire roads are within EBRPD and EBMUD areas and are accessed regularly for recreational park and open space use and operations and maintenance (O&M) activities. Existing paved roads that are planned for use during construction total 1.28 miles. As no ground disturbance will occur, these roads are not included in Table 3.5-1.

Table 3.5-1 summarizes the types and area of vehicular project unpaved access roads and expected improvements. In addition to the roads listed in Table 3.5-1, existing public paved roads throughout the area will be used to access the project site.

Table 3.5-1. Vehicular Access Roads

Road Type	Description	Area (acres)
Existing Dirt or Fire Road	Typically, these are double-track roads and oftentimes have been graded previously. No other preparation will be required, although a few sections may need to be regraded and have crushed rock applied in limited areas for traction.	5.05
Existing Dirt or Fire Road Improvement	Typically, these are double-track roads and oftentimes have been graded previously. Grading or slide repair is required to allow construction vehicle access.	3.77

Figure 3.5-1 identifies the network of existing roads that are planned for use during construction, along with improvement anticipated. Modification of existing roads will occur on some unpaved roads, areas of steep topography or dense vegetation growth, at certain intersections or road curves, and during the winter months. Some surface contouring may be required to level existing unpaved access roads. The following modifications are anticipated, and the areas are included as existing dirt or fire road improvements in Table 3.5-1:

- Some of the existing fire roads to be used as temporary access will require widening by up to 8 feet, from an average existing 12 feet, to accommodate construction equipment that may be larger than the typical fire vehicle.
- Where roads intersect at angles that cannot accommodate the turn radius of construction equipment (such as tractor-trailers hauling structure sections), curve improvements at existing access road intersections will be necessary.
- Unpaved roads may need to be winterized to accommodate heavy loads in winter or improved in areas of steep topography. Based on final design and construction scheduling, winterizing or improvement of the existing roads may include blading, compaction, rocking, and aggregate placement. If the access road is used in the wet season, construction matting or aggregate base may be laid down over geotextile fabric as needed and removed after construction.

Minimal surface contouring may be required to level the access road following vegetation or tree removal or trimming. The access road improvement will use typical road construction equipment, including bulldozers and graders. Any aggregate added to existing roads will be left in place, unless otherwise specified in landowner agreements. If incidental damage occurs to dirt roads during construction, PG&E will use the methods described to improve the roads for construction to return the road to the condition specified in landowner agreements.

3.5.1.2 New Access Roads

No new access roads are proposed for construction, and no associated temporary or permanent gates for access roads are needed.

A temporary gate is expected to be installed in existing PG&E substation fencing if the fence is temporarily removed for access to immediately adjacent construction work areas from the adjacent Moraga or Oakland X substation.

3.5.1.3 Overland Access Routes

No overland access routes are proposed for construction.

3.5.1.4 Watercourse Crossings

The lines span watercourses, including San Leandro Creek, Shephard Creek, Cobbledick Creek, Palo Seco Creek, and Sausal Creek, which are labeled on Figure 5.10-2. No vehicles or equipment will be required to cross these watercourses other than where bridged or culverted. As needed, culverts will be plated to cross. Construction areas and access routes will avoid watercourses, and no impacts to any watercourses are expected during project activities. No bridge or culvert replacement is expected.

3.5.1.5 Helicopter Access

Construction helicopter activity is anticipated to occur only in the eastern section of the project. A light-duty helicopter (Hughes MD 500, 505 Bell, or equivalent) and a medium-duty helicopter (Bell 407 LongRanger, Sikorsky UH-60 Black Hawk, or equivalent) are expected to be used. The helicopter type will depend on availability at the time of construction.

In the eastern section of the project, helicopters will be used as part of the conductor-stringing operation and to support construction survey staking; lifting or transporting of structure components; crew transport to structures; and potentially lifting of equipment for installation of micropile foundations. A medium-duty helicopter typically is used to lift equipment and line structure components. A light-duty helicopter is used to lift and transport lighter loads such as crew transportation or other lighter loads. To assist with conductor stringing, a light-duty or medium-duty helicopter will fly a lightweight sock line and thread it through traveler pulleys affixed to structure arms. The SW and OPGW will be strung in a similar manner using a sock line.

Helicopter landing zones will be located with staging areas where feasible or will use existing nearby airstrips and commercial airports; potential landing zones are shown on Figure 3.5-1. Designated areas will be identified for helicopter takeoff and landing in staging areas.

Helicopters generally will be staged and fueled at existing local airports, such as Oakland International Airport, Hayward Executive Airport, Livermore Municipal Airport, or Buchanan Field Airport. However, a fuel truck may be available at project staging areas to support refueling if needed.

The helicopter flight paths also will traverse from airports to landing zones, or from landing zones to structures under construction. Helicopters carrying any suspended load will not be flown over habitable structures. Because helicopters carrying suspended loads are not anticipated to be flown over residences, it is not anticipated that residents will be required to temporarily vacate their residences. However, in the unlikely event that final construction plans require otherwise, all FAA requirements will be met, and PG&E will coordinate with potentially affected residents (providing a minimum of 30 days of advance notice).

PG&E estimates that up to three Black Hawk helicopters will be used for approximately 22 days, likely non-consecutive (for an average of 5 flight hours per day) during construction, primarily supporting the activities described previously. Additionally, three light-duty helicopters and three medium-duty helicopters will be used for approximately 32 days, likely non-consecutive (for an average of 5 flight hours per day) during construction, primarily supporting the activities described previously. Helicopters may land and take off approximately 50 times per day from a landing zone as it transports load. The helicopter flight path generally will follow the power lines, as was done during survey staking support, and will avoid flying directly over residences. Crew transport, equipment transport, and sock line placement typically require approximately 5 minutes of hover time at each structure; the remaining daily flight time will be between the structure sites and tension pull sites or landing zones. Helicopter operations are expected to occur within the typical construction work schedule discussed in Section 3.6.5.

A drone will provide additional aerial construction support during conductor installation and removal by carrying lighter weight lines. A drone with a 32 to 34 inch propeller, such as a Callisto 50 Multirotor, will be used. It is anticipated that the drone will be used for approximately 2 calendar weeks up to 8 hours per day to pull new static and OPGW in the central and western sections and to pull and remove the sock line that is used to remove the existing conductor between Estates Drive and Oakland X Substation. Such drones have a flight time of up to approximately 40 minutes at which point the battery will need to be changed to resume operation. Use of a drone avoids use of a helicopter or extensive labor, which will involve multiple days walking the alignment, crossing through yards, dragging rope, and throwing rope over obstacles. The drone is battery powered and will not generate emissions. The drone is expected to generate no more than approximately 56 A-weighted decibels (dBA) at 50 feet. The drone will be operated by an FAA-licensed operator/person-in-charge, in compliance with the FAA requirements for unmanned aircraft.

3.5.2 Staging Areas

Approximately 21 staging areas totaling up to approximately 16 acres will be identified for use when a construction contractor is selected. It is anticipated that most of the staging areas will be located within approximately 2 miles of the work areas; however, existing PG&E facilities or other locations currently used for staging or storage may be used as well. Staging areas may include portions of Moraga, Palo Seco, Hollywood, Claremont K, and Oakland X substations; warehouses; ruderal, paved, or graveled sites; portions of Montclair Golf Course; or other existing commercially available offsite office, warehouse, or yard space.

3.5.2.1 Staging Area Locations

Potential staging areas have been identified in Table 3.5-2 and are shown on Figure 3.5-1; however, identification of specific staging area locations will be determined based on staging areas that are available at the time of construction.

Table 3.5-2. Potential Staging Areas and Landing Zones

Staging Area (SA) Landing Zone (LZ)	Staging Area Use	Approximate Area[a] (acres)	Existing Land Cover
SA01	Receiving, construction worker parking, staging and laydown	3.48	Developed
LZ01	Helicopter landing, material staging and laydown	0.23	Grassland
LZ02	Helicopter landing, material staging and laydown	0.2	Grassland
LZ03	Helicopter landing, material staging and laydown	0.17	Grassland
LZ04	Helicopter landing, material staging and laydown	0.77	Grassland
LZ05	Helicopter landing, material staging and laydown	0.66	Grassland
LZ06	Helicopter landing, material staging and laydown	0.43	Grassland
SA02	Staging and laydown	0.07	Grassland, Oak trees
SA03	Parking, staging and laydown	0.05	Ruderal
SA04	Parking, staging and laydown	0.81	Paved
SA05	Parking, staging and laydown	0.03	Ruderal
SA06	Parking, staging and laydown	0.03	Ruderal
SA07	Parking, staging and laydown	0.05	Ruderal
SA08	Parking, staging and laydown	0.29	Ruderal
SA09	Staging and laydown	0.08	Ruderal
SA10	Parking, staging and laydown	0.87	Paved
SA11	Parking, staging and laydown	0.06	Paved
SA12	Parking, staging and laydown	2.40	Ruderal
SA13	Parking, staging and laydown	1.02	Paved
SA14	Parking, staging and laydown	0.30	Ruderal
SA15	Staging and laydown	0.13	Ruderal
SA16	Parking, staging and laydown	0.59	Paved
SA17	Staging and laydown	0.26	Ruderal
SA18	Parking, staging and laydown	0.70	Paved
SA19	Staging and laydown	0.04	Ruderal

Table 3.5-2. Potential Staging Areas and Landing Zones

Staging Area (SA) Landing Zone (LZ)	Staging Area Use	Approximate Area[a] (acres)	Existing Land Cover
SA20	Staging and laydown	0.08	Paved
SA21	Construction trailer, staging and laydown	0.22	Ruderal

[a] Includes total area consider for potential use; actual footprint will be refined following discussions with landowners.

3.5.2.2 Staging Area Preparation

Vegetation and tree removal will be required to establish some work areas as listed in Table 3.5-5. Sites that are not paved or otherwise do not have a stabilized surface will require minor site preparation such as blading uneven surfaces, compacting soil, and spreading gravel or an aggregate base on the site to establish a safe work area and to control erosion. If an area is used in the wet season, construction matting or aggregate base (averaging 6 inches deep) may be laid down over geotextile fabric, as needed, and removed after construction. If the area was previously disturbed or graveled, newly installed gravel may be left permanently in place, upon landowner approval. Some areas may require vegetation removal if they are not already vacant. No grading activities are anticipated, and no slope stabilization issues are expected that may need to be addressed at staging areas.

Staging areas typically are used for office trailers, portable sanitary facilities, crew and equipment assembly areas, safety and tailboard training areas, equipment and materials storage, minor vehicle and equipment maintenance, equipment refueling, and vehicle parking.

Power will be provided to staging areas through a temporary overhead service drop if existing distribution facilities allow. If grid power is not available, portable generators may be used to provide power. Portable generators (typically 2,000 watts or less) also may be used on a limited basis to provide supplemental power depending on the number of trailers and construction activity needs. It is estimated that one generator may be required per staging area if a service drop is not possible, and that this generator will be run between 4 and 6 hours per day and is included as part of the emissions estimate for other construction activities.

Refer to Section 3.5.8.3 for a security discussion, including temporary fencing and security lighting. No temporary yard lighting is anticipated to be needed.

3.5.3 Construction Work Areas

Figure 3.5-1 shows the overhead and underground portions, substations, preliminary structure work areas, preliminary tension pull sites, potential staging areas, potential landing zones and access roads and paths.

3.5.3.1 Construction Work Areas

Construction work areas will be required at each existing and rebuild structure along the line, at road crossings to install guard structures, at the substations, at tension pull sites, and along the underground portion of the lines. Activities within construction work areas may include vehicle and equipment parking and operation; limited equipment and vehicle maintenance and fueling; material delivery, staging, and removal; structure foundation excavation or drilling and construction; structure assembly, installation, and removal; and structure-specific activities associated with tension pull stringing or conductor removal including drone use. In addition, construction work areas will include excavation and installation of vaults, duct banks and conduits for the underground portion of the cable.

Tension pull site activities may include vehicle and equipment operation and parking, limited equipment and vehicle maintenance and fueling, material delivery and staging, tension pull equipment and reel staging, temporary structure anchor installation, stringing sock line by helicopter or drone, pulling and tensioning of the conductor and OPGW, and removal of the conductor. Construction helicopter activity is anticipated to occur only in the eastern section of the project. Drones may be used within the entire project area. Temporary guard structures may be installed over roads, waterways, or other features during tension pull activities. Guard structure work areas will be located to either side of a road. Activities will include excavating holes to install the guard wood poles and installing protection or using two bucket trucks to hold the protection over a road. Helicopter landing zones or touchdown areas and helicopter fueling may be colocated with overhead line tension pull sites in the eastern section of the project and may occur at existing nearby airstrips and commercial airports.

3.5.3.2 Work Area Disturbance

Most construction work areas are expected to be within the existing alignment or franchise as described in Table 3.5-3. For in-line structures and deadend structures, work sites of approximately 100 feet by 100 feet to approximately 200 feet by 200 feet typically will accommodate framing the structure on the ground and setting the structure with one crane pick, which reduces the duration of the structure's construction. Cranes need approximately 32 feet by 40 feet to work with extend outriggers. Cranes will operate within work areas on Figure 3.5-1. Work areas with crane activities within roadways may require temporary road closures for up to 10 working days (approximately 2 calendar weeks). Structure installation will occur with each piece being lifted into place where the work area has insufficient space to assemble the full structure on the ground. Work areas for the structure removals between the overhead to underground transition location and Oakland X Substation are expected to be smaller than average being adapted to fit around adjacent constraints such as residential buildings.

Approximately six tension pull sites that average approximately 3.8 acres are expected to be used (refer to Figure 3.5-1). Tension pull sites will be finalized prior to construction within areas covered by prior resource survey and evaluation or where subsequent surveys show no unavoidable potential impacts to sensitive resources. To the greatest extent feasible, tension pull sites will be in ruderal or developed areas and will use existing roads to minimize disturbance to residences, vegetation, and sensitive habitats. The work site required for typical guard structure installation and removal will be approximately 5,000 feet. A summary of temporary work areas needed for project construction is included in Table 3.5-3.

Staging, excavation, installation, and backfilling activities for each vault in the underground portion require approximately 1,500 square feet of workspace, which will be linear (approximately 150 feet length) and located within one travel lane and one parking lane. Each vault will have an excavation size of 42 feet long by 18 feet wide by 13 feet deep and will take approximately 2 weeks to install. When the vaults are installed, the workspace for open trenching operations to install the duct bank between the vaults typically may extend up to approximately 1,500 feet long by 24 feet wide. This workspace will include the following sequential activities:

- An active excavation or open trench, which typically extends 100 to 300 feet in length
- An adjacent excavated length where the duct bank is being installed
- An adjacent length being backfilled and restored
- Other typical work area activities, including temporary material staging

Trenching work generally is expected to progress at an average of 40 to 100 linear feet per day per crew depending on soil conditions, existing utilities, and other considerations. Daily progress is expected to be 300 to 400 feet per workday. In general, closure of one travel lane and one parking lane is expected during the underground line construction, with one lane remaining open to allow through traffic. Approximately 100 to 300 feet of trench will be open at any one time depending on the permitting requirements of the cities of Oakland and Piedmont. Final lane closure plans will be determined following detailed investigations into existing utilities and final construction planning.

Table 3.5-3. Temporary and Permanent Disturbance Areas

Project Component	Anticipated Approximate Metrics
Permanent Structure (Pole or Tower) Diameter or Base Width	
Lattice Steel Tower (power line)	16 to 28 feet
Lattice Steel Pole (power line)	4.5 feet
Tubular Steel Pole (power line)	6 feet
Auger or Micropile Hole Depth and Width	
Wood (guard structure)	8 feet, 20-24 inches
Lattice Steel Tower (power line)	14 to 30 feet, up to 8 feet
Lattice Steel Pole (power line)	15 to 30 feet, up to 8 feet
Tubular Steel Pole (power line)	15 to 30 feet, up to 8 feet
Permanent Footprint per Structure, Up To	
Lattice Steel Tower (power line)	256 to 748 square feet
Lattice Steel Pole (power line)	64 square feet
Tubular Steel Pole (power line)	113 square feet
Number of Temporary Structures	
Wood (guard structures)	29
Wood (shoo-fly)	6
Number of Replacement Structures	
Lattice Steel Tower	10
Lattice Steel Pole	14
Tubular Steel Pole	24
Transition Single Circuit or Vertical Double Circuit (single pole)	5
Transition H-frame (two pole excavations for each H-frame)	2
Number of Structures Removed and Not Replaced	
Lattice Steel Tower (power line)	20
3HP direct-bury light-duty steel pole (power line)	1
Tubular Steel Pole (power line)	1
Average Work Area around Structure	
Power line or shoo-fly work areas	14,500 sq. feet
Guard structure wood pole work areas	5,250 sq. feet
Tension Pull Site work areas	27,500 sq. feet
Average Excavation and Work Area around Vault and Duct Bank	
Vault excavation area	9,828 cubic yards
Vault excavation work area	1,500 sq. feet
Duct bank excavation	4.5 feet by 5 feet
Duct bank excavation work area	24 feet by 1,500 foot-length
Number of Vaults and Length of Duct Bank	
Vault (power line)	5-10 per line, or 10-20 total
Duct bank (power line), includes vaults lengths	2.44 miles
Total Approximate Metrics[a]	
Total Temporary Footprint for Project Work Areas[b]	**Approximately 54.51 acres**
Total Permanent Footprint Overhead Portion (aboveground structures)	**Approximately 0.27 acres**

Table 3.5-3. Temporary and Permanent Disturbance Areas

Project Component	Anticipated Approximate Metrics
Total Permanent Footprint for Underground Portion (duct banks with vaults)	**Approximately 2.44 miles**

[a] Total acreages estimated using project geographic information system data.

[b] Total temporary footprint for project work areas includes work areas outside of and within substations (approximately 47.31 acres total) and trench excavation area for both duct banks (approximately 22 feet by 2.44 miles, or approximately 7.10 acres).

3.5.3.3 Temporary Power

Portable diesel generators may be used on a limited basis to provide power at construction work areas. Portable diesel-fueled construction equipment with engines 50 horsepower or larger and manufactured in 2000 or later will be registered under the CARB Statewide Portable Equipment Registration Program (PERP). At contractor staging areas where office trailers are temporarily parked, a customer service feed drop from the existing distribution grid is expected to be installed from an adjacent distribution line. No ground disturbance is expected for temporary power service drops from existing distribution lines.

3.5.4 Site Preparation

The limits and access of each work area will be identified and marked prior to construction at the work area to support utility mark-and-locate activities, surveying and staking, and any preconstruction resource surveys, installation of fencing or signs for protection of sensitive resource areas, vegetation or tree work, erosion and sediment control measures installation, and security considerations.

3.5.4.1 Surveying and Staking

Surveyors will stake the work limits where existing access road improvement is needed and rebuild structure locations and underground components. Surveyors will mark the ground with paint, flags, stakes, or other similar means to mark. Surveyors will mark road surfaces with paint typically to identify work areas within roadways. In the eastern, central, and western portions of the project, construction survey staking will occur using ground-based activities. A light-duty helicopter (Hughes MD 500, 505 Bell, or equivalent) is expected to be used to support construction survey staking to identify rebuild structure locations in the eastern section of the project.

3.5.4.2 Utilities

Prior to any excavation, PG&E will notify utility companies (via the Underground Service Alert {USA]) to locate and mark existing underground structures along the power line rebuild locations and any other area of ground disturbance. Additionally, PG&E will conduct exploratory excavations (potholing) to prove the locations for proposed facilities as needed. A final determination on the need to relocate utilities will be made during final engineering. Localized underground utilities will be identified during final design and will be either avoided or relocated in coordination with the facility owner. If buried utilities are identified during construction and it is not reasonably feasible to avoid the line, PG&E will coordinate with the utility owner to relocate the facility. Construction methods will be adjusted as necessary to assure that the integrity of existing utility lines is not compromised. If any utility requires relocation, PG&E will provide adequate operational and safety buffering.

Third-party (AT&T) mobile phone antennas located on two existing towers will be relocated by the third party.

During conductor installation or removal, the existing PG&E power or distribution line or third party telecommunication lines that cross the power line will be taken out of service as needed. Overhead distribution lines or third-party communication lines may need to be temporarily relocated to allow safe operation of construction equipment during certain activities such as vault installation using a crane depending on field conditions at the time of the construction activity. No outage locations are known at this time. Should distribution power line outages be required, they will be planned and electrical power customers will be notified in advance of planned outages. Distribution line clearances are typically scheduled for up to 8 hours. However, power will be restored as soon as safe to do so. Sometimes work near power lines can occur safely when a qualified monitor can direct the activity or protective equipment is a feasible means to protect the workers from an electric shock hazard of an energized line. Typically, it is safer to take a clearance to avoid the potential hazard of working near an energized line.

PG&E will comply with the provisions found in California Division of Occupational Safety and Health (CalOSHA) Title 8 of the CCR, particularly the electrical health and safety regulations found in Chapter 4, Subchapter 5, in the Electrical Safety Orders, Sections 2700–2989, which are relevant to high-voltage work. Around the substations, tall chain-link fence is topped with 1 foot of barbed wire extending around the substations, thereby restricting site access. The pedestrian and vehicle entrance into the substations is gated and monitored remotely; thus, access is restricted to only authorized personnel. Warning signs are posted around the perimeter of the substations' fences and gates to alert PG&E personnel of potential electrical hazards. Substations include the use of copper ground grid, grounding the exterior fence, nonconductive fence panels, and ground wells. Any personnel with access are properly trained according to PG&E standard practices.

PG&E's facilities are designed and constructed with grounding devices and, in the event of a lightning strike on a power line, this safety feature ensures that the strike is discharged to appropriate ground and all workers are trained in appropriate safety procedures. Other potential construction hazards include the presence of high-voltage, open-air conductors, which can create a high-temperature electrical arc between the electrical conductor and people or objects. During construction, work planning includes locating and identifying electrical hazards. To avoid electrical hazards, work is located at a safe distance from the lines, or the electrical power lines can be deenergized. In situations where the potential for electrical hazards cannot be avoided, additional precautions include wearing personal protective equipment, including arc flash resistant apparel, or using nonconductive rubber matting as a nonconductive barrier between energized electrical lines and workers. The public is excluded from work areas within the alignment and in the substations. When power lines are energized during construction and operation, they are suspended in the air at the requisite ground clearance distance that avoids shock or arc flash hazard to the public.

For overhead communication utilities that need to be temporarily relocated or removed, PG&E will coordination with the facility owner to temporarily relocate or remove of the lines to create a safe work area. Typically, up to 8 hours will be requested to temporarily relocate or remove lines.

At contractor staging areas where office trailers are temporarily parked, a customer service feed drop from the existing distribution grid is expected to be installed from an adjacent distribution line. If temporary power is needed for construction, the PG&E crew or contractor will apply for a utility service drop from the local electric service provider. Typically, a customer electric line will be connected from the nearest distribution line in the area before a customer's connection point, which is fed to the meter.

3.5.4.3 Vegetation Clearing

Trees, ornamental landscaping, shrubs, brush, and grasses or other organic matter may be trimmed or removed for to allow construction equipment or vehicles to operate safely within a work area, for clearance requirements for access needs or for GO 95 conductor clearance (the proposed new span between RS26 and transition structures TS27A and TS27B). PG&E will coordinate with landowners when planning tree, ornamental landscape, or other vegetation trimming or removal on private property. Vegetation trimming and removal will be kept to the minimum necessary for structure placement or removal, underground portion installation, power line operation and access.

When tree roots are encountered during excavation and root removal is required to install underground components, adjacent tree canopy trimming or tree removal may be necessary as determined by a project arborist if the remaining roots are deemed insufficient to maintain a healthy tree. Approximately 71 trees are expected to be removed from Park Boulevard's central median and along Park Boulevard

Way where the underground portion is in adjacent lanes. Conservatively, all trees in the central median are identified for potential removal given the early design phase.

If required, vegetation will be trimmed/removed along access roads or overland access routes, as necessary, for safe vehicle and equipment movement and operation. Adjacent trees may be trimmed to avoid damage from construction vehicles and maintain safe lines of sight.

Table 3.5-4 summarizes the estimated disturbance within vegetation communities. Permanent removal of vegetation associated with structure footprint is estimated for the proposed project. Types of vegetation expected to be trimmed, removed, or mowed are listed in Table 3.5-5.

A vegetation management crew, typically two people, will access work areas in a line truck or pickup truck with trailer, as needed. Traffic control will guide traffic where access is temporarily blocked by vegetation or tree clearing crews. Following coordination with landowners and any preconstruction resource surveys, vegetation will be trimmed or removed with appropriate equipment, typically including boom trucks, manual clippers, weed whackers, chain saws, chippers, and blowers. Stumps may need to be removed to provide access. Generally, removed vegetation will be shredded in place and either spread nearby or hauled offsite (typically using 10-cubic yard dump trucks) to either a commercial recycling/composting facility or landfill for proper disposal. Larger woody branches and trunks may be cut into lengths generally less than 4 feet and left onsite. Vegetation material may be stockpiled within the footprint of Moraga Substation or a staging area and contained onsite until its removal for appropriate disposal.

Table 3.5-4. Estimated Disturbance Within Vegetation Communities

Vegetation Community Type	Temporary Disturbance (approximate acreage[a])	Permanent Disturbance (approximate acreage[a])
California Bay Forest	0.09	-
Coast Live Oak Woodland	4.93	0.01
Construction Site	1.17	-
Native Grassland	0.00	-
Non-Native Grassland	10.61	0.03
Northern Coyote Brush Scrub	1.00	0.01
Northern Maritime Chaparral	0.14	-
Park	2.05	-
Restoration Site	0.19	-
Ruderal	0.01	-
Upland Redwood Forest	0.06	-
Urban	36.84	0.01
Urban Mix	1.28	-
Valley Needlegrass Grassland	0.59	-

[a] Some project components overlap in geographic information systems and the totals in this table were adjusted to avoid double counting approximate acreage.

Low-lying vegetation and small shrubs will be brushed using mower-type equipment. Where it is feasible for construction equipment to travel overland, or where trees have not grown within the footprint of the project, trees and shrubs will be trimmed without the need to remove roots and stumps. Removal of the trees will be required if a tree or portions of it interfere with the safe passage of construction equipment or if the tree has grown within the project footprint.

During the O&M phase of the project, vegetation management will continue as currently occurring for the existing lines. PG&E expects overgrowth to be encountered occasionally along access routes and the project footprint and will clear brush as necessary. Clearing of vegetation will be completed according to

PG&E's vegetation management practices to ensure access is safe and to minimize impacts to biological resources. No O&M vegetation management is expected to be required along the underground portion.

3.5.4.4 Tree Trimming and Tree Removal

To ensure safe power line operation, the CPUC has issued GO 95, which specifies the required minimum distance between the ground and conductors that must be maintained for a variety of land uses beneath power lines. Conflicts can arise when trees grow into these established clearance zones or buildings are built within these zones. Tree trimming to comply with GO 95 is not expected for the existing alignment. The new span between RS26 and TS27A and TS27B will require approximately 17 trees to be removed as detailed in Table 3.5-5. Tree removal will be conducted in a similar manner to the vegetation removal described in Section 3.5.4.3. Table 3.5-5 lists the numbers and species of trees and other vegetation types expected to be trimmed or removed as part of the project.

Table 3.5-5. Estimated Vegetation Management including Tree Trimming or Removal

Common Name, Species (sp.), Native or Non-Native if known	General Project Location and Work Area or Access Type	Expected Activity	Approximate Quantity, dbh[a]
Grass			
Grasses (unknown sp.)	EN1 Work Area	Mow	Not applicable
Grasses (unknown sp.)	ES1 Work Area	Mow	Not applicable
Grasses (unknown sp.)	EN3 Access Road	Mow	Not applicable
Grasses (unknown sp.)	ES3 Access Road	Mow	Not applicable
Grasses (unknown sp.)	EN7-ES7 Work Area	Mow	Not applicable
Brush			
Brush (unknown sp.)	EN9-ES10 Access road	Remove	1, 2 dbh
Brush (unknown sp.)	EN10-ES11 Access road	Remove	1, 2 dbh
Brush (unknown sp.)	EN15-ES17 Guard structure	Remove	1, 1 to 3 dbh
Brush (unknown sp.)	EN19-ES21 Access road	Remove	1, 1 to 3 dbh
Brush (unknown sp.)	EN19-ES21 Access road	Remove	1, 1 to 3 dbh
Brush (unknown sp.)	EN21-ES23 Foot path	Remove	1, 1 to 3 dbh
Brush (unknown sp.)	EN21 Work area	Remove	1, 1 to 3 dbh
Brush (unknown sp.)	EN23-ES25 Access road	Remove	1, 1 to 3 dbh
Brush (unknown sp.)	EN27-ES29 Work area	Remove	1, 2 dbh
Brush (unknown sp.)	EN26-ES28 Work area	Remove	1, 2 dbh
Brush (unknown sp.)	EN25-ES27 Work area	Remove	1, 2 dbh
Brush (unknown sp.)	EN28-ES30 Guard structure	Remove	1, 2 dbh
Brush (unknown sp.)	Oakland Substation parcel work area	Remove	1, 2 dbh
Brush (unknown sp.)	Underground Portion, Park Blvd center median Glenfield Ave to Hampel St	Remove	3, 2 dbh
Shrub			
Coyote Brush (*Baccharis pilularis*)	ES1-ES2 Access road	Remove	1, 1 to 4 dbh
Coyote Brush (*Baccharis pilularis*)	RS2 Work area	Remove	1, 1 to 4 dbh
Elderberry (*Sambucus sp.*)	RS2 Work area	Remove	1, 10 dbh
Coyote Brush (*Baccharis pilularis*)	RN2 Work area	Remove	1, 4 dbh
Coyote Brush (*Baccharis pilularis*)	EN3 Access road	Remove	1, 3 dbh
Coyote Brush (*Baccharis pilularis*)	ES3 Access road	Remove	1, 3 dbh
Beaked hazelnut (*Corylus cornuta*)	EN9-ES10 Access road	Remove	1, 12 (multistem) dbh
Toyon (*Heteromeles arbutifolia*)	EN9-ES10 Access road	Remove	1, 8 dbh

Table 3.5-5. Estimated Vegetation Management including Tree Trimming or Removal

Common Name, Species (sp.), Native or Non-Native if known	General Project Location and Work Area or Access Type	Expected Activity	Approximate Quantity, dbh[a]
Toyon (*Heteromeles arbutifolia*)	EN27-ES29 Foot path	Remove	2, 10 dbh
Elderberry (*Sambucus sp.*)	ES30 Work area	Remove	1, 5 dbh
Tree			
Coast Live Oak (*Quercus agrifolia*), Native	RS2 Work area	Remove	1, 9 dbh
Apple (Malus pumila), Non-native	RS2 Work area	Remove	1, 5 dbh
California bay laurel (Umbellularia californica), Native	RS2 Work area	Trim	1, 20 dbh
Coast Live Oak (*Quercus agrifolia*), Native	RN2 Work area	Remove	1, 13 dbh
Coast Live Oak (*Quercus agrifolia*), Native	RN2 Work area	Remove	1, 12 dbh
Coast Live Oak (*Quercus agrifolia*), Native	RN2 Work area	Remove	1, 17 dbh
Coast Live Oak (*Quercus agrifolia*), Native	RN2 Work area	Remove	1, 10 dbh
Coast Live Oak (*Quercus agrifolia*), Native	RN2 Work area	Remove	1, 28 (2 stem) dbh
Coast Live Oak (*Quercus agrifolia*), Native	RN2 Work area	Remove	1, 37 (3 stem) dbh
California bay laurel (*Umbellularia californica*), Native	RN2 Work area	Remove	1, 16 (4 stem) dbh
California bay laurel (*Umbellularia californica*), Native	RN2 Work area	Remove	1, 2 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN3 Access road	Remove	1, 4 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN3 Access road	Trim	1, 16 dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES3 Access road	Remove	1, 3 dbh
California bay laurel (*Umbellularia californica*), Native	ES3 Access road	Remove	1, 3 dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES3 Access road	Remove	1, 8 dbh
Willow (*Salix sp.*), Native	EN3-ES3 Access road	Remove	1, 4 dbh
California bay laurel (*Umbellularia californica*), Native	EN3-ES3 Access road	Remove	1, 6 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN7-ES7 Access road	Trim	1, 20 dbh
California bay laurel (*Umbellularia californica*), Native	ES8A&B Landing zone	Remove	1, 23 dbh
California bay laurel (*Umbellularia californica*), Native	EN9-ES10 Access road	Trim	4, 4 to 20 dbh
California bay laurel (*Umbellularia californica*), Native	EN9-ES10 Access road	Remove	1, 8 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN9-ES10 Access road	Remove	12, 4 to 20 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN9-ES10 Access road	Remove	4, 14 to 16 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN9-ES10 Access road	Remove - dead wood	3, 14 to 16 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN10-ES11 Access road	Remove	1, 18 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN10-ES11 Access road	Remove	1, 42 (2 stem) dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN10-ES11 Access road	Remove	1, 15 dbh
California bay laurel (*Umbellularia californica*), Native	EN10-ES11 Access road	Remove	2, 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN10-ES11 Access road	Remove	4, 7 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN10-ES11 Access road	Remove	2, 24 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN10-ES11 Access road	Trim	2, 26 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN13 Work area	Trim	1, 27 dbh

Table 3.5-5. Estimated Vegetation Management including Tree Trimming or Removal

Common Name, Species (sp.), Native or Non-Native if known	General Project Location and Work Area or Access Type	Expected Activity	Approximate Quantity, dbh[a]
Ornamentals and Fruit trees, Non-native	ES17 Work area	Remove	8, 5 to 10 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN15-ES17 Guard structure	Remove	3, 8 to 10 dbh
California bay laurel (*Umbellularia californica*), Native	EN15-ES17 Guard structure	Remove	1, 12 dbh
Monterey Cypress (Hesperocyparis macrocarpa), Native (ornamental)	EN15-ES17 Guard structure	Remove	1, 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN15-ES17 Guard structure	Remove	3, 8 and 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN16-ES18 Work area	Trim	1, 22 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN16-ES18 Guard structure	Remove	1, 15 dbh
Madrone (*Arbutus menziesii*), Native	EN16-ES18 Guard structure	Remove	1, 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES18 Work area	Remove	1, 30 dbh
Monterey Pine (*Pinus radiata*), Native (ornamental)	ES18 Work area	Remove	1, 20 dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES19 Work area	Trim	1, 26 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN18-ES20 Work area	Remove	2, 8 and 15 dbh
Monterey Cypress (*Hesperocyparis macrocarpa*), Native (ornamental)	EN18-ES20 Work area	Remove	1, 26 dbh
Coast redwood (*Sequoia sempervirens*), Native	EN18-ES20 Work area	Remove	2, 10 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN19-ES21 Access road	Trim	32, 4 to 20 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN21-ES23 Access road	Trim	4, 28 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN21-ES23 Work area	Remove	17, 6 to 12 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN21-ES23 Work area	Remove	10, 12 to 15 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN21-ES23 Work area	Remove	4, 25 to 28 dbh
Eucalyptus (*Eucalyptus sp.*), Non-native	EN21 Work area	Remove	1, 4 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN21 Work area	Remove	1, 7 dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES24 Work area	Remove	1, 9 to 12 dbh
Madrone (*Arbutus menziesii*), Native	ES24 Work area	Remove	1, 14 (2 stem) dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN22 Work area	Remove	2, 12 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN22 Work area	Remove	3, 3 dbh
Acacia (*Acacia sp.*), Non-native	EN22 Work area	Remove	1, 13 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN22 Work area	Remove	2, 10 dbh
Catalina Cherry (*Prunus ilicifolia Lyonii*), Non-native	EN22-ES24 Guard structure	Remove	12, 8 to 15 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN23-ES25 Access road	Remove	2, 12 and 13 dbh
Acacia (*Acacia sp.*), Non-native	EN23-ES25 Access road	Remove	3, 3 to 9 dbh
California bay laurel (*Umbellularia californica*), Native	EN23-ES25 Access road	Trim	1, 26 dbh
Acacia (*Acacia sp.*), Non-native	EN23-ES25 Access road	Remove	2, 10 to 25 dbh
Plum *(Prunus sp.*), Non-native	EN23-ES25 Access road	Remove	1, 4 dbh
Acacia (*Acacia sp.*), Non-native	EN23-ES25 Access road	Remove	1, 20 dbh
Monterey Cypress (*Hesperocyparis macrocarpa*), Native (ornamental)	EN23-ES25 Access road	Trim	1, 22 dbh
Acacia (*Acacia sp.*), Non-native	EN23-ES25 Access road	Remove	4, 5 to 18 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN25-ES27 Work area	Remove	1, 28 dbh

Table 3.5-5. Estimated Vegetation Management including Tree Trimming or Removal

Common Name, Species (sp.), Native or Non-Native if known	General Project Location and Work Area or Access Type	Expected Activity	Approximate Quantity, dbh[a]
Monterey Pine (*Pinus radiata)*, Native (ornamental)	EN26-ES28 Work area	Remove	6, 4 to 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN26-ES28 Work area	Remove	2, 3 dbh
Acacia (*Acacia sp*.), Non-native	EN26-ES28 Work area	Remove	2, 3 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN27-ES29 Foot path	Trim	8, 15 to 25 dbh
American Elm (*Ulmus americana*), Non-native	EN27-ES29 Foot path	Remove	9, 6 to9 dbh
California bay laurel (*Umbellularia californica*), Native	EN27-ES29 Foot path	Remove	1, 7 dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES30 Work area	Remove	4, 4 to 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN28-ES30 Guard structure	Remove	1, 6 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN29-ES31 Guard structure	Remove	7, 6 to 15 dbh
California bay laurel (*Umbellularia californica*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	1, 82- multistem dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	2, 25 (3xstems) dbh
California bay laurel (*Umbellularia californica*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	1, 55 (3xstem) dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	3, 40 (2xstems) dbh
California bay laurel (*Umbellularia californica*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	1, 16 (2xstems) dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	1, 14 dbh
California bay laurel (*Umbellularia californica*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	2, 12 (2xstems) dbh
Coast Live Oak (*Quercus agrifolia*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	1, 18 dbh
California bay laurel (*Umbellularia californica*), Native	ES31/RS26 Work area and new span to TS27A and TS27B	Remove	5, 9 (2+3 stems) dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN30-ES32 Work area	Remove	3, 8 to 25 dbh
Sweetgum (*Liquidambar styraciflua*), Non-native	EN30-ES32 Work area	Remove	4, 14 dbh
Coast Live Oak (*Quercus agrifolia*), Native	EN30-ES32 Work area	Remove	6, 10 to 14 dbh
California bay laurel (*Umbellularia californica*), Native	EN30-ES32 Work area	Remove	1, 8 dbh
Acacia (*Acacia sp*.), Non-native	EN30-ES32 Work area	Remove	3, 4 to 13 dbh
Alder (Alnus sp.), Native	EN37 Work area	Remove	1, 22 dbh
Coast Live Oak (*Quercus agrifolia*), Native	East side of Oakland Substation parcel Work area	Remove	2, 26 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Estates Dr to St. James Dr	Remove	2, 4 to 8 dbh
Coast redwood (*Sequoia sempervirens*), Native	Underground Line, Park Blvd median Estates Dr to St. James Dr	Remove	1, 32 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median St. James Dr to Trestle Glen Rd	Remove	2, 3 to 6 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Trestle Glen Rd to Cavendish Ln	Remove	2, 7 dbh

Table 3.5-5. Estimated Vegetation Management including Tree Trimming or Removal

Common Name, Species (sp.), Native or Non-Native if known	General Project Location and Work Area or Access Type	Expected Activity	Approximate Quantity, dbh[a]
Dwarf date palm (*Phoenix roebelenii*), Non-native	Underground Line, Park Blvd median Trestle Glen Rd to Cavendish Ln	Remove	1, 7 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Hollywood Ave to El Centro Ave	Remove	12, 3 to 14 dbh
Dwarf date palm (*Phoenix roebelenii*), Non-native	Underground Line, Park Blvd median Hollywood Ave to El Centro Ave	Remove	4, 6 to 8 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median El Centro Ave to Everett Ave	Remove	2, 5 to 10 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Everett Ave to Wellington St	Remove	10, 5 to 13 dbh
Dwarf date palm (*Phoenix roebelenii*), Non-native	Underground Line, Park Blvd median Everett Ave to Wellington St	Remove	1, 8 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Wellington St to Glenfield Ave	Remove	3, 6 to 8 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Glenfield Ave to Hampel St	Remove	13, 5 to 12 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Hampel St to Brighton Ave	Remove	3, 3 to 8 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Brighton Ave to Beaumont Ave	Remove	5, 3 to 8 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, Park Blvd median Beaumont Ave to Park Blvd Way	Remove	2, 8 dbh
London plane tree (*Platanus x acerifolia*), Non-native	Underground Line, along Park Blvd Way	Remove	7, 6 to 10 dbh
Dwarf date palm (*Phoenix roebelenii*), Non-native	Underground Line, along Park Blvd Way	Remove	1, 7 dbh

[a] dbh = diameter at breast height (typically 4.5 feet), a measurement in inches for brush, shrubs, and trees.

City of Oakland and the Contra Costa County have tree ordinances addressing native species and trees of a certain size. These ordinances are summarized and with an approximate count of trees expected to be trimmed or removed as part of the project:

- Coast Live Oak measuring 4 inches dbh or larger is protected in the City of Oakland and a permit is required for the removal of the trees, which is not applicable to this project. In the City of Oakland:
  - Approximately 80 Coast Live Oak measuring 4 inches dbh or larger are expected to be removed
  - Approximately 5 Coast Live Oak with a 3-inch dbh measurement or larger are expected to be removed
  - Approximately 47 Coast Live Oak are expected to be trimmed
- Any tree measuring 9 inches dbh or larger except *Eucalyptus* sp. and Monterey Pine (*Pinus radiata*) is protected in the City of Oakland and a permit is required for the removal of the trees, which is not applicable to this project. In the City of Oakland:
  - Approximately 129 trees with a dbh of 9 inches or larger (other than Coast Live Oak, *Eucalyptus* sp, and Monterey Pine) are expected to be removed
  - Approximately 2 trees with a dbh of 9 inches or larger (other than Coast Live Oak, *Eucalyptus* sp., and Monterey Pine) are expected to be trimmed

- Any of the trees listed in Contra Costa County Tree Ordinance section 816-6.6004 is protected and a permit is required (although a permit will not be required for this project) to cut down, destroy or trim by topping where the listed tree is adjacent to or part of a riparian, foothill woodland or oak savanna area, or part of a stand of four or more trees, measures 20 inches or larger in circumference (approximately 6.5 inches in diameter) as measured 4.5 feet from ground level. In Contra Costa County:
  - Approximately 46 trees and approximately 1 shrub listed as indigenous species are expected to be trimmed or remove and may be considered a protected tree.
  - Approximately 35 Coast Live Oak, approximately 10 California bay laurel, approximately 1 Willow species and approximately 1 Toyon shrub may be considered adjacent to or part of a riparian, foothill woodland or oak savanna area, or part of a stand of four or more trees, measures 20 inches or larger in circumference (approximately 6.5 inches in diameter) as measured 4.5 feet from ground level.

3.5.4.5 Work Area Stabilization

If a work area is used in the wet season, construction matting or aggregate base (averaging 6 inches deep) may be laid down over geotextile fabric, as needed, and removed after construction if requested by the property owner. Unpaved roads may need to be winterized to accommodate heavy loads in winter. Based on final design and construction scheduling, winterizing of the existing roads may include blading, compaction, rocking, and aggregate placement, as described previously.

At road intersections, access roads being used for construction may need to be widened to accommodate the turn radius of tractor-trailers hauling structure sections. Earthen ramps may be required when crossing existing berms and embankments. Ramps will be constructed using excess clean fill generated during construction and removed upon completion of construction. Minimal surface contouring may be required to level the access road following vegetation or tree removal or trimming.

3.5.4.6 Grading

Earth moving or substantial grading is not expected to be necessary to establish the work areas or tension pull sites; however, some limited surface blading, grading, and filling to create a stable and level work area to create a stable crane platform, for example, may occur on an as-needed basis. At slope transitions, native fill, steel plates, construction mats, or earthen ramps will be placed to cross over uneven terrain or abrupt changes in topography. The existing access road to EN9 and ES10 has a section requiring repair for construction vehicle access and ground disturbance may include grading below a 6-inch depth. An area of approximately 215 square feet will be repaired along an approximate 60-foot section of the access road. The existing access road width is approximately 12-20 feet. Cut and fill is not expected. Excavation for the underground portion is discussed in Section 3.5.6.

3.5.5 Power Line Construction (Aboveground)

The existing and replacement structure construction activities generally will occur along the lines in pairs (one structure for Circuits 1 and 2 and one structure for Circuits 3 and 4). For each pair of structures between EN1/ES1 and EN28/ES30 that is being replaced, PG&E expects to construct the replacement foundations, install the new structures, transfer the existing conductor to pulleys on the new structures, and then remove the existing structures and, as feasible, foundations. It is expected that work on the rebuilt Circuits 3 and 4 will complete before Circuits 1 and 2. This will allow TN27A/B for Circuits 1 and 2 to be installed with ES30 of Circuits 3 and 4 removed. Structures EN29/ES31 to EN37/ES38 are expected to be removed after the new hybrid circuits are in place and operational.

3.5.5.1 Structures

The proposed project will begin with building the overhead replacement structures, which are expected to be LSTs, LSPs, and TSPs.

Lattice Steel Towers. A crane or helicopter will be used to lift each assembled tower section into place. A helicopter will only be used in the eastern section of the project. Leg assemblies will require temporary support until the entire base, including all four legs, is assembled and stabilized. Body sections will be lifted into place by a crane or a helicopter, followed by the window, arms, and bridge (also called the head section). During installation, crews will be on the tower placing and tightening bolts throughout these processes. Gin poles, which are motorized equipment with winches and pulleys used to erect structures, may be used where needed based on site conditions and access. Workers will climb the towers in the eastern section that are proposed to be reused to replace top section pieces. A helicopter will lift and remove pieces to replace portions of existing crossarms and insulators as well install overhead OPGW and static ground wire attachment points. Construction helicopter activity is anticipated to occur only in the eastern section of the project.

Lattice Steel Poles. A crane will be used to lift each assembled LSP section into place. Body sections will be lifted into place, followed by the window, arms, and bridge. During installation, crews will be on the pole placing and tightening bolts throughout these processes.

Tubular Steel Poles. Tubular steel pole installation will be conducted with typical ground-based equipment, such as cranes, flatbed trucks, and line trucks. Using a crane, the new TSP with attached arms will be set on the foundation and attached using anchor bolts. The two recently replaced TSPs are expected to have their top sections removed and replaced including new arms and wire attachment points. Transition structures, being a type of tubular steel pole, are installed using the same methods.

Foundations. Two types of structure foundations are expected to be used: single drilled-shaft reinforced concrete and micropile.

Each LST foundation excavation will range from approximately 3 to 8 feet in diameter and 14 and 30 feet in depth and could be larger depending on geotechnical conditions. Typical excavations for new LSP and TSP structure foundations will range from approximately 6 to 8 feet in diameter and approximately 15 to 30 feet in depth; some foundations could be larger depending on site-specific geotechnical conditions. Excavation for each transition poles is expected to be approximately 4 to 5 feet in diameter and approximately 20 to 30 feet in depth.

Drill rigs will be used to install the foundations. Steel casings may be used to stabilize subsurface soils; these will be advanced by the drill rig or a vibratory hammer attached to a crane or a combination of these methods. For all the foundations for these structures, approximately 1.5 feet of crushed stone backfill will be placed at the bottom of the excavation. Foundation excavation pits will be surrounded by fencing or covered when the site is inactive.

For single drilled-shaft reinforced concrete foundations, crews will place the cage support and formwork into the excavation; the steel reinforcement cage will be installed by crane. The cage may include full-length anchor bolts and ties (or shorter-length anchor bolts along with full-length steel reinforcement bars), as well as spacers to provide minimum concrete cover, as required by code at all faces of the completed foundation. The cage may be assembled onsite or offsite at project staging areas. A typical caisson foundation (approximately 3 to 7 feet in diameter and approximately 20 to 25 feet up to approximately 30 feet in depth) will require approximately 32 cubic yards of concrete. Concrete from a commercial concrete supplier will be delivered by trucks directly to structure work sites. After the concrete has reached an acceptable strength, the cage supports can be removed and the pole sections may be installed.

Alternative foundation types may be considered where required by subsurface geotechnical conditions, project schedule, or other constraints. These could include screw piles and micropiles, rock anchors, pad and pedestal or shallow foundations, and grillages. If micropiles are required at a foundation location (4 to 16 or more micropiles per location is typical), these generally will extend deeper than piers. Micropiles are often used when there are difficult environmental factors such as soil conditions, sensitive ground with adjacent structures, or limited headroom. They are drilled and grouted pile foundations, typically reinforced with a casing or a center reinforcing bar, that are typically 12 inches in diameter or smaller and are expected to be drilled to a depth of approximately 30 feet on average. They are constructed by drilling a borehole, placing a steel rod into the hole, and then pressure grouting around the rod. They are designed to transfer the structural load of the foundation from the unsuitable soil layer to a better-suited soil layer by placing high values of friction on the rock and soils below. Additionally, a concrete or steel cap is sometimes required to transfer the structure loads to the foundation elements. Shallow foundations may be used in areas where hard rock occurs or where conditions are otherwise difficult for excavation. Track-mounted shovels will be used for this type of excavation for shallow foundations.

The surface and subsurface layers will be stockpiled separately and returned to their approximate locations in the soil profile or will be disposed of offsite at an approved disposal location. Excess soils from the excavation will either be spread out and compacted onsite to avoid erosion or runoff or hauled off and disposed of at a soil-handling facility. If disposed of offsite, excess soils may either be shoveled into hauling trucks by hand or with a backhoe, or shoveled into bags by hand or with a backhoe and lifted offsite with a helicopter in the eastern section where the bags will be transported to hauling trucks.

Material Delivery and Structure Assembly. Flatbed trucks will deliver materials to the site. LST materials will be delivered to each site in bundles. Crews will assemble these bundles within the designated work site and use a crane or helicopter to lift them into place. LSPs and TSPs will be delivered to the work site in sections and assembled at ground level using a crane or helicopter and cribbing to keep the assembly off the ground. Construction helicopter activity is anticipated to occur only in the eastern section of the project.

In areas where the typical construction work area is not feasible because of proximity to residences or other buildings, areas with dense vegetation cover, or in areas of steep topography, a reduced footprint may be required. This reduced footprint will likely require less-efficient construction for the structures through a process called "stick framing." Stick framing requires that each section be installed in place: the first section is lifted onto the foundation or directly embedded base section; then subsequent sections and arms are set in place, one at a time, requiring multiple crane picks.

The most efficient way to install a structure is to lay the sections on the ground, then frame and assemble the sections on the ground before lifting the entire structure in a single crane operation or pick. As an alternative, the contractor may choose to use existing disturbed areas, such as access roads, to frame structures on the ground.

Structure arm assembly will be conducted within the structure work sites. The sections typically will be framed at ground level, using the crane and cribbing to keep the assembly off the ground. These assemblies typically include the arms, insulators, and hardware necessary to support the conductors. Subsequently, framed sections will be lifted into place by the crane.

Where there is sufficient clearance between the existing conductors and structures and the replacement structures, the new arms will be attached in the horizontal position to the structure on the ground prior to installation. Where the new structure arms will be too close to the existing conductors or structures when installed, they will be attached in a vertical hanging position and raised to the horizontal position after existing nearby conductors are removed. Structure arms will be tied down or weighted to prevent damage from vibration caused by wind prior to the conductors being installed. Traveler pulleys will be hung in preparation for conductor installation. Temporary bracing of the structure may be required during transfer of the conductor to the new structure, or removal of the conductor, both described in Section 3.5.5.2.

A temporary shoo-fly may be used to keep existing power line or distribution line conductor suspended while the replacement structure is being installed or an existing structure is removed. A shoo-fly is created by temporarily relocating existing lines to one or more light-duty steel or wood pole to allow work to occur on the structure being removed or replaced. Refer to guard structure discussion in Section 3.5.5.4 for how a direct-bury pole will be installed and removed.

Removal of Existing Structures. Structure accessibility requires varying approaches to removing existing structures and foundations with work area limitations. Where helicopter or crane access is possible, they will be used to lift disassembled structure sections to the ground for further disassembly. To remove the top section, a helicopter or crane will be rigged to the top of the structure and sections will be unbolted or cuts will be made at the desired removal point. The structure will be lifted and lowered to the ground, where it will be cut into smaller sections and either transported to a laydown area or directly to a recycling facility. To remove the lower section, the legs or structure base will be cut off just above the foundations and a boom truck or helicopter will remove the remaining sections. Construction helicopter activity is anticipated to occur only in the eastern section of the project.

In other locations, structures are expected to be cut and removed piece by piece by hand and carried out by hand. Structure pieces will be sorted into waste bins or trucks for hauling away. Removed structures will be taken from the site using typical hauling equipment and disposed of at an appropriate offsite location. The existing LDSP structures (ES8A and ES8B) have no foundations and are expected to be pulled out of the ground using a hydraulic jack attached to a line truck. When removed, each pole hole will be backfilled and the clean dirt will be compacted.

Existing foundations will be removed, including all concrete and steel typically 3 feet below ground surface, unless cutting them off below ground surface will increase environmental impacts or a landowner prefers to keep the foundation in place on the property. Where the concrete foundation is not left in place, it will be removed to up to approximately 3 feet below ground using hand tools and jack hammers as needed. Any excavation resulting from foundation removal will be filled in with compacted soils excavated from the new structure foundation sites. To the greatest extent possible, all cut materials from the overhead power line will be reused as fill following suitability testing. Representative samples of excess soil will be collected, analyzed, and profiled for disposal in accordance with all federal, state, and local regulations. Engineered fill material will be imported as needed to accomplish the necessary compaction and final grade.

3.5.5.2 Aboveground Conductor/Cable

Conductor stringing typically proceeds in reel-length segments of a power line circuit. When conductors are strung between structures, tension pull sites are used to raise the conductors to the proper ground clearance height and to the proper conductor tension. Figure 3.5-2 shows a typical conductor stringing diagram, including stringing equipment. Conductor stringing will proceed in discreet segments. To haul the conductor to the tension pull sites, reel trailers with reel stands will be mounted on line trucks or semi-trucks. On the line truck, pullers will be mounted to install the conductor. When conductors are strung between structures, equipment at tension pull sites is used to raise the conductors to the proper ground clearance height and to create proper conductor tension. The conductor-stringing effort requires multiple reels of conductor to be installed from designated tension pull sites. Temporary guard structures will be installed prior to conductor installation to protect vehicle and pedestrian crossings, railroads, waterways, and existing utilities should the conductor fall from the structures during construction as described in Section 3.5.5.4.

The process will begin with replacing existing insulators with temporary traveler pulleys at each structure within the segment. Crews then pull a sock line through the traveler pulleys. In some lengths, replacement structures may be installed first and the existing conductor will be moved to the new structures before reconductoring will occur.

In the eastern section, a sock line could be pulled by a light-duty helicopter (Hughes MD 500 or equivalent) and threaded through traveler pulleys affixed to structure arms while the helicopter hovers typically for less than 5 minutes at the structure. The existing conductor may be used as the sock line to pull in the new conductor on all four circuits between Moraga Substation and structures RN10/RS10, using a helicopter. The existing conductor also may be used to pull in the new conductor between structures RN21/RS21 and the new transition structures TN27A&B/TS27A&B. A hard line is attached to the sock line and pulled through the traveler pulleys under a specified tension. The conductor then is attached to the hard line and pulled through the travelers under its specified tension. Alternatively, the existing conductor will be transferred to the new structure, and this conductor (or, if not feasible, a sock line) will be used to pull the new conductor into place. Battery-operated drones may be used to install the pulling line for the SW. After the new conductor is pulled into place, the sags between the structures are adjusted to the design-specified ground clearance; minimum ground clearance will meet GO 95 specifications. The conductors then will be clamped to the end of each insulator. The final step of the conductor installation will be to install vibration dampers and other accessories. When sagged, the conductor can be dead-ended and clipped to a structure, during which time the travelers are removed. SW and OPGW installation are pulled into place and tensioned using a similar process.

When the replacement conductors are installed and the hybrid rebuild lines are in use, the existing conductors between EN29/EN31 and Oakland X Substation will be removed by reversing the conductor installation process. The existing conductor will be pulled onto wire reels at a tension pull site to remove it from the structures pulling until a sock line is in place. A drone will be used to remove the sock line between EN29/EN31 and Oakland X Substation by carrying the end of the sock line between structures under the line is removed to the tension pull site. The conductor lengths will be removed by truck and trailer depending on the amount and taken to an appropriate facility.

When multiple reels of conductor are pulled for a power line segment, conductor splices join the two ends of conductor together. Compression splicing is a mechanical process where two ends of a conductor are pressed together. Because compression splices generally are not pulled through conductor stringing blocks, they will be performed at structure work areas, roads, and other disturbed areas where crews and equipment can perform the compression on the ground or be lifted to the conductor level to perform the splice.

Locations of six potential tension pull sites are identified on Figure 3.5-1. The average distance between tension pull sites is between approximately 4,000 and 8,500 feet. The area of the potential sites ranges between approximately 0.2 acre and 1.5 acre.

3.5.5.3 Telecommunications

The OPGW will be installed in the top conductor position of Circuits 1 and 2 on the northern line and will transition underground at the same location as the power lines. When transitioned underground, this cable is referred to as a fiber optic cable, and it will be installed in a dedicated conduit within the duct bank for each power line using the same methods and equipment described in Section 3.5.5.2. The OPGW will be strung and tensioned in a similar manner using the same equipment as the overhead conductors as described in Section 3.5.5.2. Between structures EN1 and EN10, in the eastern section of the project, the pulling line will be installed by helicopter. Between EN10 and TN27A&B, the pulling line will be installed by drone.

3.5.5.4 Guard Structures

Guard structures may be created with line trucks or wooden poles with crossbeams or netting. Where wood poles are used, an auger will excavate holes where the wood poles will be embedded. A hole is expected to be excavated up to approximately 8 feet deep and have an approximately 20- to 24-inch diameter. A crane or line truck will place the wood pole in the excavation hole. The native soils will be used to backfill the excavation and support the pole. Two vertical poles will be connected by a horizontal pole used as a beam to provide the protection. During installation, equipment generally will be staged from existing roadways or disturbed areas. In instances where netting is required, such as the SR 13 crossing, crews will install temporary anchors and guy wires to support H-frame structures. Netting then will be installed between two cables that are attached to each H-frame structure on either side of the crossing. Example guard structures in use on other projects are shown on Figure 3.5-3. For pedestrian trails, in open space areas, and at other crossings, traffic controls or flaggers may be used in place of physical structures. In place of using guard structures over distribution lines, existing distribution lines may be taken out of service when such line clearances, or outages, are not in conflict with customer needs or nonconductive rubber matting may be placed directly on the distribution line to protect the line. If such line clearances are necessary, they will be coordinated in advance with each customer. When guard structure poles are removed, the hole is backfilled and the dirt is compacted.

3.5.5.5 Blasting

Blasting will not be used for project construction.

3.5.6 Power Line Construction (Below Ground)

A description of the vaults is provided in Section 3.3.3.2. The first operation during construction of the duct bank and splice vault system will be excavation for the placement of the vaults. Because these are the largest components that will be placed underground, it is typical to have the initial construction crew excavate and place the vaults prior to the trenching and duct bank installation work. This process provides fixed ends for the trenching and duct bank crews to work toward, should any minor adjustments on the location of the vaults occur during construction. When adjacent vaults are installed, trenching and duct bank installation between the vaults can begin. Trenchless techniques are not expected to be used for project construction. Cable installation will occur when the full length of the double-circuit duct bank for the power lines is installed.

3.5.6.1 Step 1: Vault Installation

The underground power lines will require the installation of vaults at approximately 800-1,000-foot intervals. An excavation will be performed using excavators. Excavated soil, pavement, concrete and road base is estimated to have a volume of approximately 9,828 cubic yards per vault. The vault excavation requires shoring components such as driven sheet piles or slide rail steel sheeting. When the initial excavation and shoring is installed, preparation of the subbase involves installing crushed rock to level to a finished grade.

Precast vaults will be delivered in sections by the vault manufacturer. Shipment of vaults from the vault manufacturer to the site will be done via a flatbed trailer. These vault sections will be inspected for flaws and if found acceptable will be prepared for installation.

When the vault preparation steps (excavating, shoring, finished grade leveling, and vault installation) are completed, precast vault sections are lifted and set using either a hydraulic or a lattice-type crane. Most vaults are expected to have three utility covers for access to the cable. Telecommunications vaults will be constructed in-line with the duct bank system to provide pulling and splicing locations for telecommunications cable. One telecommunication vault will be constructed within approximately 40 feet of each splice vault. Each telecommunications vault will have one utility cover to access the vault. With all sections of a vault set in place, backfilling can start when the shoring is removed. After the vault is placed and backfilled, temporary road restoration work will occur.

3.5.6.2 Step 2: Trenching/Duct Bank Installation

After the route is surveyed and marked, the trench will be made by using a saw cutter to remove sections of pavement, followed by a backhoe to remove pavement base and remove underlying soil up to the trench depth. The trench excavation to install the duct bank will be approximately 4 feet wide by approximately 5 feet deep on average but may occasionally be deeper (up to 10 feet), depending on field conditions, the presence of other utilities, and the depth of vaults along the route. Excavated soil can be tested for contaminants prior to construction or during construction. If done prior to construction, testing of soil will require soil samples to be taken from several locations along the route. If done during construction, excavated soil will be removed and placed in storage until the soil can be tested for contaminants. If no contaminates are found, excavated ground soil may be used as backfill or disposed of at a nearby landfill. If contaminants are found, excavated soil will be disposed of at an appropriate landfill. Using an approximate total length of 2.44 miles and an average depth of 5 feet, a total of approximately 257,644 cubic yards of material (primarily soil) is expected to be removed from the trenches; of this, approximately 40 percent or 103,058 cubic yards will be used as backfill and approximately 154,589 cubic yards will be removed for disposal at an appropriate offsite facility.

When final trench excavation depth is reached, a second work crew secures the trench walls via shoring. When the shoring process is complete for an approximately 150- to 300-foot section, another crew will install conduit, providing a raceway for the electrical cable. The conduits will be placed on sandbags and will be encased in a thermal concrete casing at least 1.5 feet thick. Thermal concrete will be poured directly from a concrete truck into the trench to encase the conduits.

Where the electrical line duct bank crosses or runs parallel to other substructures that have operating temperatures at earth temperature, the preferred radial clearance is 24 inches; however, in some locations, a minimum radial clearance of 12 inches may be required depending on the existing utilities within the route. For example, these substructures may include fiber optic lines, gas lines, telephone lines, water mains, storm lines, and sewer lines. In addition, a 5-foot minimum radial clearance will be required where the new duct bank crosses another heat-radiating substructure at right angles. A 15-foot minimum radial clearance will be required between the duct bank and any parallel substructure with an operating temperature significantly exceeding the normal earth temperature. Such heat-radiating facilities may include other underground power lines, primary distribution cables (especially multiple-circuit duct banks), steam lines, or heated oil lines.

PG&E has performed subsurface utility surveys and will continue to identify utilities prior to final design. PG&E will evaluate the proximity of utilities and potential for induced current and corrosion and, in coordination with the utility system owner, will determine whether steps are necessary to reduce the potential to induce current or cause corrosion.

Conductive objects, such as ungrounded wire fences, residential rain down spouts, or other metal objects within or adjacent to the alignment, can receive sufficient electrical charge through induced current to cause a nuisance shock. During final design, PG&E will identify where induced currents from the power lines could charge conductive non-utility facilities. PG&E will use grounding methodology to manage induced currents associated with project facilities. For example, one grounding rod (or more) will be attached to a metal fence to create a path for electrical current to travel into the ground to dissipate.

PG&E will take the necessary steps in coordination with those utility system owners to minimize any potential effects through measures such as increased cathodic protection or utility relocation. Cathodic protection is achieved through using a system the includes galvanic anodes made of metal alloy that corrodes before the metal infrastructure that it is protecting. Final design will include a cathodic protection system as part of the grounding function for the approved project location. The steps are summarized as follows:

- During final design, PG&E prepares a study of corrosion and induced currents.
- PG&E sends results of the study to each affected owner for review and comments.
- Owners submit requirements for protection of each of their facilities.
- PG&E makes changes accordingly or compensates the owner for future protection measures, in accordance with the owner's preference.

The conduit casing will be covered by a non-bonding agent/barrier and will be a minimum of 3 feet below the road surface. The space between the agent/barrier and the road surface will consist of a controlled density fluidized thermal backfill that will be placed above the concrete that encases the conduit and will be compacted. Backfilling material is expected to include various types of engineered material generically referred to as flowable or controlled-density fill. Flowable thermal concrete (FTC), lime slurry, or an appropriate alternative such as sand will be used around the conduits. Controlled density fluidized thermal backfill will be above the conduits. Each material has unique properties specific to its application, while both are designed to have thermal characteristics for heat displacement. For a typical trench, the bottom 2 feet encases the conduit with FTC while the remainder of the trench is filled with diggable controlled density fill to the roadway subbase level. If lime slurry is unavailable, a low-strength thermal concrete is an alternate approved material that meets PG&E thermal backfill requirements. While the completed trench sections are being restored, additional trench lines will be opened farther down the road. This process will continue until the entire conduit system is in place.

3.5.6.3 Step 3: Cable Installation/Pulling, Splicing, and Termination

This cable system consists of three major components: the cable, splices that connect cable sections, and terminators that connect the cable to the equipment at the substations.

Cable Installation/Pulling

A cable consists of three individual conductors (one per electrical phase) bundled into one strand and a communication fiber optic cable. To pull each cable through the duct bank, a cable reel is placed at the end of a duct bank section in a vault, and a pulling rig is placed at the other end of the duct bank section in another vault. With a small rope called a fish line, a larger rope is pulled into the duct. The fishline is installed between each vault by blowing the cloth rope from one end with a handheld blower. The large rope is attached to pulling eyes on a conductor end, and the large rope pulls the conductor into the duct. To ease pulling tensions, a lubricant is applied to the conductor as it enters the duct.

Cable Splicing and Termination

Prior to starting the actual splicing, the vault is outfitted with steel racks to ensure that the cable splices are securely affixed to the vault's inner walls. After the racks have been installed, a splice trailer with a mobile power generator is positioned adjacent to the vault access cover. During splicing, the vaults must be kept dry to prevent water or impurities from contaminating the unfinished splices.

Cable Termination

The cable for each of the four circuits will continue underground to Oakland X Substation, where each will transition aboveground on a transition structure. The circuits then will be terminated at the existing exterior terminals on the Oakland X Substation building.

3.5.7 Substations and Switching Station

Prior to placing the new power line components into service, PG&E must ensure that the components, as well as the overall system, have adequate protection from electrical faults and other system abnormalities. Some substation components, like buses, circuit breakers and air switches may require replacement including the equipment structures or foundation depending on their condition at the time of construction.

3.5.7.1 Installation or Facility Modification

When PG&E determines if the buses, circuit breakers and air switches require replacement, replacement equipment will be delivered on a truck and lifted into place after the old equipment is removed. Equipment structures and foundation will be reviewed as part of the equipment replacement and may be replaced as well. Refer to line structure foundation description for a general discussion of foundation replacement. To commission the new circuit breaker, wiring within the boundary of the substation will be modified and/or replaced, as needed. If construction work were required, the replacement activities will occur. No changes to buildings, structures, or fencing will occur at either substation. Fencing removed for adjacent line structure work will be replaced in kind.

All work at Moraga and Oakland X substations will take place within existing PG&E property and will involve changing out equipment to be compatible with the new conductors and looping the new OPGW into existing control equipment. Modifications to the system protection hardware packages within local control buildings will be required following installation of the conductor and looping in of the OPGW. These upgrades will include the addition of new relays and associated mounting infrastructure.

Depending on the findings of the review, the duration of the protective relay device modifications could be 1 day for setting adjustments to 5 weeks for replacement of system protection devices.

3.5.7.2 System Protection Modifications

Prior to placing the new power lines into service, PG&E must ensure that the components, as well as the overall system, have adequate protection from faults and other electrical abnormalities. At Moraga and Oakland X substations and the PG&E grid control centers will be evaluated. The equipment (relays) may require adjustments to coordinate with the new equipment or may need to be upgraded or replaced.

Simple setting adjustments may be all that is necessary for protective devices of the same vintage and compatibility. Firmware upgrades may be needed if the devices are not of the same vintage and capability. Full device replacement may be required to address the existing vintage, capability, or compatibility.

The work will occur within the control rooms of the existing facilities, and it is minor in nature. The replacement of protective relay devices is a typical operation and maintenance activity and will be performed prior to placing the new equipment into service. Depending on the scope, the duration could be approximately 1 day for setting adjustments to approximately 5 weeks for replacement of system protection devices. The trucks expected to be used for personnel and material transport are listed in Table 3.6-1.

3.5.7.3 Civil Works

No civil work is required for substation modifications. The project does not anticipate including construction of or modification to slopes, drainage, retention basins, or spill containment.

3.5.8 Public Safety and Traffic Control

3.5.8.1 Public Safety

No special construction techniques are expected for the project.

Any personnel with access to energized electrical substations will be properly trained according to PG&E standard practices. Other potential construction hazards include the presence of high voltage, open-air conductors, which can create a high-temperature electrical arc between the electrical conductor and persons or objects. PG&E's power lines and substation facilities are designed and constructed with grounding devices, and in the event of a lightning strike on a power line, this safety feature ensures that the strike is discharged to appropriate ground, and all workers will be trained in appropriate safety procedures, as described in Applicant-Proposed Measure (APM) HAZ-3.

No change to the existing perimeter fence type is expected to occur at PG&E Moraga or Oakland X substations. If a portion of the fence is removed for construction access, temporary fencing or an access gate will be installed, and the fence will be replaced in kind at the completion of the construction.

All work will be completed on private land or where PG&E has permanent or temporary land rights or easement and where access is limited to qualified individuals. Signage and temporary and permanent fencing will be used to inform and protect the public near the construction site. Flaggers will be used as standard safety practices for large equipment deliveries and offloads, including safe movement of traffic on highways and streets in accordance with Section 21400 of the California Vehicle Code.

Clearly visible barriers with cautionary signage will be placed around active construction sites, especially sites on or adjacent to roadways and recreation trails. Any open excavations will be securely covered at the end of each construction day.

Prior to stringing conductors, temporary guard structures will be installed at road crossings and other locations where the new conductors may otherwise contact electrical or communication facilities, waterways, or vehicular traffic during installation. Refer to Section 3.5.5.4 for details on guard structures.

Specific project areas where public access may be restricted for safety purposes are expected to include some public roads and some sidewalks. Public road access may be temporarily disrupted as described in Section 3.5.8.2.

3.5.8.2 Traffic Control

PG&E will follow its standard safety practices, including installing appropriate barriers between work zones and transportation facilities, posting adequate signs, and using proper construction techniques. PG&E will coordinate construction traffic access for work areas and access. PG&E is a member of the California Joint Utility Traffic Control Committee, which published the California Temporary Traffic Control Handbook (2018). PG&E will follow the recommendations in this manual regarding basic standards for the safe movement of traffic on highways and streets in accordance with Section 21400 of the California Vehicle Code. PG&E will comply with all notification requirements as prescribed by the cities of Orinda, Oakland, Piedmont and Contra Costa County, and any Caltrans encroachment permits.

Prior to construction, all traffic control and encroachment permits will be obtained, and traffic control will be implemented in keeping with Transportation APMs. A typical plan for traffic control provides detail on the temporary work locations and temporary road use restrictions and will be prepared as part of the Transportation APMs. Traffic control will be implemented during removal of the existing overhead conductor and installation of the replacement conductor where the lines cross over roads.

The appropriate traffic control configuration will be set up and in place ahead of construction activities, and may include traffic control cones, candles, electronic signage boards, and temporary fixed roadway warning signs for construction personnel prior to reaching the work area in both directions and at egress/ingress to work areas, as well as appropriate barricades if a total road closure should be required. PG&E also will coordinate provisions for emergency vehicle and local access with the cities, Contra Costa County, or other responsible entity.

For particularly important crossings (such as highway or high-traffic roadways), it may be necessary to control traffic during critical operations at that crossing. Prior to construction, all traffic control and encroachment permits will be obtained, and traffic control will be implemented. For highway or high-traffic county roadway crossings, it may be necessary to control traffic during critical conductor-stringing activities. Any road closures outside of anticipated work areas that must occur on private, city, or county roads are not expected to exceed approximately 5 minutes in duration. For the SR 13 crossing, the California Highway Patrol and Caltrans will be contacted to organize 5-minute rolling stops. Any necessary permits will be obtained from the affected agencies.

No complete long-term road closures are expected, although one-way traffic controls and short-term road closures of up to approximately 10 working days (2 calendar weeks) will be implemented to allow for certain construction activities (anticipated for crane work activities) and to maintain public safety. Refer to Figure 3.5-1 for work areas within roadways. Cranes may be set up and operate from other work areas as well. When cranes are set up in a roadway, they are expected to be able to be set up to not block driveway access. Other than the footprint of a crane, work areas within roadways are anticipated to require temporary lane or road closure only during daily construction work hours. At the conclusion of a construction work day, a work area in a roadway will be demobilized and temporary lane or road closures will end. Other than four locations, temporary road closure locations will have ingress and egress available on both sides of the closures (refer to Table 5.20-3). Access to the residences at the end of these roads is expected to be maintained; however, vehicular access may be restricted and residents may need to park their cars on the road up to approximately 200 feet away. These residents will be offered the option of safe transport to and from their residence, per APM TRA-1. The other work areas shown on Figure 3.5-1 that may require temporary road closures have secondary access; egress options are available from either side of the work areas.

3.5.8.3 Security

All construction locations where equipment or materials are left onsite overnight will enforce multiple security measures. Temporary fencing, consisting of an approximately 6- to 8-foot-tall chain-link fence with up to an additional approximately 2 feet of barbed wire, will be installed around laydown areas, equipment storage sites, and other sites as necessary. These sites will be locked at night or when constructure crews are not at the site. Security personnel may provide 24-hour surveillance at each location and remote security/cameras while in use for project construction. Nighttime lighting and alarms may be used, at a minimum, at mobilization sites where equipment, tools, materials, and crew personal vehicles will be housed. Small, focused, downcast lights will be used to illuminate the exterior fenceline and construction trailer doorways and stairs for safety.

3.5.8.4 Livestock

Where existing fencing needs to be removed for access, a temporary gate will be installed in coordination with the landowner. If livestock are present in open space areas during construction activities, installation of five-strand barbed wire around construction work areas and staging areas may be required. Electrified fencing is not anticipated to be needed.

3.5.9 Dust, Erosion, and Runoff Controls

Construction ground-disturbing activities, including grading and vegetation clearing, have the potential to contribute to construction-related dust, erosion, and runoff. The project will obtain coverage under the State Water Resources Control Board General Permit for Stormwater Discharges Associated with Construction Activity, Order No. 2009-0009-DWQ. Permit coverage will include developing and complying with a project stormwater pollution prevention plan (SWPPP). In conjunction with the SWPPP, appropriate best management practices (BMPs) will be developed for each activity that has the potential to degrade surrounding water quality through erosion, sediment runoff, and other pollutants. These best practices then will be implemented and monitored throughout construction of the project by a qualified SWPPP Practitioner.

3.5.9.1 Dust

During all phases of construction, appropriate measures will be taken to minimize the generation of fugitive dust. Water or other suitable dust suppressants will be applied to project access roads and work areas; stockpiled materials will be covered or otherwise stabilized as needed to control fugitive dust. Stockpiled soils will be compacted, covered, or sprayed with water to prevent dust. Water will be sprayed on an as-needed basis when noticeable dust particles are on unpaved roadways or substations yards. Use of an ecologically compatible chemical dust suppressant will be encouraged to decrease the quantity of potable water needed for dust control.

3.5.9.2 Erosion

A small, temporary stockpile of excavated soil may be located near a structure excavation to be used as backfill. Stockpiles will be located away or downgradient from waterways. Sediment and erosion control BMPs will be implemented to minimize and control erosion, including gravel bags, silt fences, and straw wattles, and post construction stabilization, including restoration of sites and reseeding where appropriate.

BMPs, including gravel bags, silt fences, and straw wattles, will be used to control dust and minimize erosion potential. Refer to Section 5.10, Hydrology and Water Quality. Drainage and erosion control design measures include erosion control blankets and riprap. The SWPPP will include measures to limit erosion and offsite transport of pollutants from construction activities. The SWPPP will identify the measures that will be followed during construction to help stabilize disturbed areas and reduce erosion, sedimentation, and pollutant transport.

3.5.9.3 Runoff

The existing grade at construction areas and access roads will not change and the existing drainage patterns will be maintained. The project SWPPP will include appropriate sediment and runoff control BMPs for the project work areas. Several of the BMPs that will be employed to manage erosion also will serve to manage stormwater and minimize sediment transport in stormwater runoff. These BMPs could include installation of gravel bags, silt fences, straw wattles, and drain inlet protection at the perimeter of areas and dirt access roads. Stabilized construction access exits will be established where necessary to minimize trackout of sediment onto paved roads in compliance with the project SWPPP; refer to Section 5.10, Hydrology and Water Quality.

3.5.10 Water Use and Dewatering

Water is expected to be used mainly for dust control. Dewatering may be required seasonally at some locations if groundwater is encountered or if rainfall collects in excavated areas.

3.5.10.1 Water Use

Water trucks will support project construction activities with dust suppression. Approximately two water trucks with an approximate 4,000-gallon capacity may be used daily for dust suppression during the access road improvement or other construction activities using dirt access roads or unpaved staging areas. However, the total volume available within the trucks onsite is not expected to be used daily.

PG&E estimates that a maximum of approximately 8,000 gallons of water will be needed daily for dust suppression. It is anticipated that water will be sourced from local municipal sources close to the project area, which obtain their water from EBMUD. Depending on availability and distance to active construction, PG&E may supplement project water needs by using recycled water available from EBMUD's main wastewater treatment plant in West Oakland, which may only be used in EBMUD's service area, as described in Section 5.17, Utilities and Service Systems.

3.5.10.2 Dewatering

Groundwater is not expected to be encountered during trenching, and dewatering is not expected to be needed. If dewatering is required, the water will be sampled and characterized prior to removal and discharge as described in Section 5.10, Hydrology and Water Quality. As appropriate, the water may be pumped into containment vessels (such as Baker tanks) and tested for parameters such as turbidity and pH or as otherwise required. As permitted, groundwater or rainwater will be discharged to a local publicly owned treatment works facility, an upland location, reused for irrigation if appropriate, trucked to an appropriate treatment and/or disposal facility, or used for dust control after testing for parameters such as turbidity and pH or as otherwise required.

3.5.11 Hazardous Materials and Management

3.5.11.1 Hazardous Materials

The project is not expected to use or store large quantities of hazardous materials. During construction, petroleum-based products such as gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents will be used to fuel, lubricate, and clean vehicles and equipment. Refer to Table 3.5-6 for estimated types, uses, and volumes of hazardous materials expected to be used by the project equipment and vehicles in the onboard tanks for the duration of construction activities.

Table 3.5-6. Types, Uses, and Approximate Volumes of Hazardous Materials Used in Construction

Hazardous Material	Use	Approximate Volume (gallons)
Diesel	Engine fuel	309,132
Gasoline	Engine fuel	35,422
Jet fuel	Fuel	38,119
Hydraulic Fluids/Lubricants	Engine and equipment lubrication and powering of hydraulic equipment	19,134
Other Construction Fluids (solvents)	Cleaning, lubricating hardware, etc.	957

Hazardous materials identified will not be stored onsite. All fueling and storage will occur offsite.

Diesel and gasoline fuel volumes are from Section 5.6 Energy, Appendix D.

Hydraulic fluids and lubricants volumes are anticipated to be 5 percent of total fuel volumes.

Other construction fluids volumes are anticipated to be 5 percent of hydraulic fluids and lubricants volumes.

No herbicides or pesticides are expected to be used during construction. If a pre-existing hazardous waste is encountered during construction, PG&E will follow its existing procedures to identify, remove and dispose of the waste according to the applicable regulations.

3.5.11.2 Hazardous Materials Management

Hazardous materials such as fuel, grease, and fluids needed for equipment operation will be onsite periodically and handled in keeping with the project SWPPP and APMs that address the proper use, storage, and cleanup (if warranted). All hazardous materials will be used and stored as instructed by Safety Data Sheets (SDSs) that will be provided to onsite personnel in case of emergency. Hazardous materials will be transported per applicable regulations such as in specialty trucks or in other approved containers, as described in Section 5.9, Hazards and Hazardous Materials. When not in use, hazardous materials will be properly stored to prevent drainage or accidents.

Additionally, appropriate best practices will be implemented to minimize the effects of an accidental spill such as the presence of spill kits in active work areas to prevent materials from draining onto the ground or into drainage areas. One of the Moraga Substation 115 kV circuit breakers expected to be replaced has an existing volume of mineral oil that exceeded 1,320 gallons. Its spill prevention and containment design measures and practices are included in Moraga Substation's existing Spill Prevention, Control, and Countermeasure Plan consistent with Code of Federal Regulations Title 40, Parts 112.1 to 112.7.

The proposed project is not expected to use or store large quantities of hazardous materials, but fuel, grease, lubricants, and fluids needed for equipment operation will be onsite periodically and handled in keeping with the project SWPPP and APMs that address the proper use, storage, and cleanup (if warranted). All hazardous materials will be used and stored as instructed by SDSs that will be provided to onsite personnel in case of emergency. Hazardous waste will be transported per applicable regulations to an appropriate facility for disposal; refer to Section 5.8, Hazards and Hazardous Materials. Herbicides or pesticides are not anticipated to be used during construction.

3.5.12 Waste Generation and Management

Project activities are expected to generate and manage solid waste, liquid waste, and hazardous waste.

3.5.12.1 Solid Waste

Soil removed during excavations, having been precharacterized, will be placed directly into trucks, removed from the area, and disposed of offsite at an appropriate landfill, or it will be used for backfill if clean. At remote locations in the eastern section of the project, soils will be deposited into a rock bag and flown with a helicopter to a staging area or spread out around on the ground surface at the immediate site of the excavation per landowner agreements. If soils were flown to a staging area, that materials will then be placed directly into trucks as described previously. Spoils that are not useable and/or are identified as contaminated through appearance will be tested to characterize before appropriate transportation to a licensed landfill facility. Off haul from road improvement is not expected to require removal from the project. A total of approximately 297,948 cubic yards will be removed for disposal at an appropriate offsite facility, such as Waste Management Altamont, 10840 Altamont Pass Road Livermore, CA 94511.

Wood guard poles will either be reused or recycled. If a pole's condition does not allow reuse, the pole will be recycled or disposed of in an appropriate manner by PG&E.

In addition, crews will gather and sort recyclable and salvageable materials into bins. PG&E expects to recycle or reuse conductor after being removed. The metal framing removed from is expected to have 10 percent recycled and 90 percent disposed as construction waste. Salvageable items (such as useable conductor, steel, and hardware) will be sold through available markets. Some examples of items that may be recycled include replaced substation fence sections, damaged steel from pole assemblies, conductor segments, conductor reels, pallets, and broken hardware. The wood poles used for guard structures will be returned to the staging area and, depending on the condition of each pole, may be reused or disposed of in a Class I hazardous waste landfill or in the lined portion of a certified municipal landfill. Construction of the proposed project also will generate waste materials that cannot be reused or recycled (materials such as wood, soil, vegetation, and sanitation waste); local waste management facilities will be used for the disposal of these types of construction waste.

When possible, various waste materials generated during construction will be recycled and salvaged. Construction debris will be picked up regularly from construction areas and stored in approved containers onsite; the debris will be hauled away for recycling or disposal periodically during construction. Construction debris including recyclables (metal poles, pole framing, fencing, and pavement), untreated wood, clean soil and green waste will occur at an appropriate facility such as at Bee Green Recycling, 725 Independent Road, Oakland California 94621 (only recycling); Contra Costa Transfer & Recovery Station, 951 Waterbird Way, Martinez, California 94553; Davis Street Transfer Station, 2615 Davis Street, San Leandro California 94577; Keller Canyon Landfill, 901 Bailey Road, Pittsburg, California 94565; or Waste Management Altamont, 10840 Altamont Pass Road, Livermore, California 94511.

3.5.12.2 Liquid Waste

The dust control methods outlined in this chapter will result in minor amounts of water waste that will follow existing drainage patterns. Construction staging areas will include berms and other methods to contain excess water applied for dust control, concrete wash water, and similar liquid construction wastes. Portable restroom facilities will generate minor amounts of liquid waste that will remain contained to the facilities until their removal during regular cleanings by vendors. Concrete washout stations will be established within staging and laydown areas to contain the washout. If the washout is removed before it hardens, concrete slurry can be taken to Waste Management Altamont, 10840 Altamont Pass Road, Livermore, California 94511. Measures to address these liquid wastes will be implemented in accordance with the project SWPPP, as described in Section 5.10, Hydrology and Water Quality. Hazardous liquid waste will be disposed of using the methods listed in Section 3.5.12.3.

3.5.12.3 Hazardous Waste

There are no large volumes of known hazardous waste generated by or resulting from project construction. Minor volumes of hazardous waste will be disposed of using the methods described previously. Limited hazardous waste will be generated during both project construction and operations and will be handled and disposed of in accordance with local, state, and federal requirements. Typical hazardous waste derived during construction may include limited quantities of used oil, containers, rags, and other used petroleum products. In addition, waste from existing steel tower components, concrete footings, and treated wood poles will be generated during replacement. Steel tower components are expected to have lead paint. Steel tower components found with lead paint will be removed and disposed of at a licensed waste facility per applicable regulations. Concrete footings may contain asbestos; if so, they also will be removed and disposed of at a licensed waste facility per applicable regulations.

If precharacterization has not occurred, the soil will be stockpiled separately onsite to be tested, managed, and transported for disposal as appropriate. If suspected hazardous substances or waste are unexpectedly encountered during trenching activities (using indicators such as sheen, odor, and/or soil discoloration), work will be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. Appropriate personal protective equipment will be used, and waste management will be performed in accordance with applicable regulations. If excavation of hazardous materials is required, the materials will be disposed of in accordance with applicable regulations.

Potentially hazardous waste streams during construction may include soils excavated during foundation installation and trenching for the underground cable. Soils will have been precharacterized and, if deemed hazardous waste, will be placed directly into trucks during excavation and will be removed from the area and disposed of offsite at an appropriate landfill.

Although treated wood waste is not expected, it has the potential to be classified as hazardous waste if it contains elevated levels of arsenic, chromium, copper, pentachlorophenol, or creosote. Treated wood waste often can be identified visually by tags or markings on the wood, when cut staining is visible around the perimeter only, or by discoloration or odor. If encountered, the treated wood waste will be managed in accordance with applicable California and federal regulations. Treated wood waste is expected to be taken to a suitable facility such as Vasco Road Landfill, 4001 North Vasco Road, Livermore, California, 94550.

3.5.13 Fire Prevention and Response

Fire prevention and response procedures during construction are expected to follow standard utility practices and no fire breaks are expected.

3.5.13.1 Fire Prevention and Response Procedures

PG&E will follow its construction fire prevention and response procedures during construction. Procedures are updated per regulation and best practice innovations. The procedures include fire prevention and suppression methods training and briefing for construction workers. Procedures for minimizing potential ignition, including vegetation clearing, parking requirements/restrictions, idling restrictions, smoking restrictions, proper use of gas-powered equipment, use of spark arrestors, and hot work restrictions are included in worker training. PG&E has work restrictions during Red Flag Warnings and High to Extreme Fire Danger days as detailed in the wildfire mitigation plans (refer to Section 5.20, Wildfire). During days with increased wildfire risk potential, procedures may include storage of fire suppression tools and backpack pumps with water within approximately 30 feet of work activities or larger water sources, including water storage tanks or water trucks that will be used in case of a fire. Additional procedures may include assigning personnel to conduct a “fire watch” or “fire patrol” to ensure that risk mitigation and fire preparedness measures are implemented, to report a fire immediately, and to coordinate with emergency response personnel in the event of a fire.

Hot work and welding are not anticipated to be required in work areas; however, as a precaution, if working in grassy areas or around dry vegetation, it will be trimmed and removed from the work area to minimize fire risk. In addition, water trucks and water buffalos (water tanks on trailers) will be present in areas where there is an elevated risk of fire in alignment with PG&E's Construction Fire Prevention standards.

3.5.13.2 Fire Breaks

No fire breaks are expected to be needed. Hot work is not planned as part of construction in or near vegetated areas. Dry vegetation and grasses within work areas and existing dirt access roads will be mowed, trimmed, or removed prior to work activities as described in Section 3.5.4.3.

3.6 Construction Workforce, Equipment, Traffic, and Schedule

Construction workforce, equipment, traffic, and schedule are estimated for the project activities.

3.6.1 Construction Workforce

The peak workforce is estimated to be up to 117 workers per day during the peak month of construction (October 2027), and average daily workforce will consist of approximately 62 workers. In addition, up to 12 management and compliance monitoring personnel will be present per day on average. On a typical workday during 2027, up to 8 crews will be performing project activities as described in Table 3.6-1. During structure installation, several crews may be working on various segments of the lines and at the substations. The breakdown by construction activity is as follows:

- Structure removal and rebuild: approximately 2 crews will be working on various segments
- Substation work: approximately 1 crew will be working at each of Moraga and Oakland X substations to install new equipment
- Underground vault and trenching work: approximately 2 crews will be working in a linear fashion along the underground portion
- Conductor stringing: approximately 3 crews will be in the field, working at pull and tension sites and using helicopters or drones, depending on location. Construction helicopter activity is anticipated to occur only in the eastern section of the project. Drones may be used within the entire project area.

Table 3.6-1 lists the expected equipment and personnel by construction activity. Not all equipment and personnel listed in Table 3.6-1 may be used during all portions of the activity. This is a preliminary equipment list, and other equipment may be identified when project design is finalized, or during construction if unexpected conditions require additional equipment.

3.6.2 Construction Equipment

Table 3.6-1 lists the anticipated equipment and personnel to be used by construction activity. Not all equipment and personnel listed in Table 3.6-1 may be used during all portions of the activity. This is a preliminary equipment list, and other equipment may be identified when project design is finalized, or during construction if unexpected conditions require additional equipment. The start and end date ranges in Table 3.6-1 align with the estimated construction schedule provided in Table 3.6-3.

The anticipated construction start date moved from the initial estimate of October 2026 to the current anticipated start in August 2028 after the environmental analysis completed. Dates in the PEA are updated except in select sections such as PEA Sections 5.3 Air Quality, 5.6 Energy 5.8 Greenhouse Gas Emissions, Appendix A Emissions Calculations, and Appendix D Energy Calculations which reflect the initial estimated dates, when construction would be approximately 22 months earlier. Refer to the methodology sections of the individual environmental analysis sections for discussion.

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
PG&E Rebuild Lines Overhead and Remove Existing East of Estates Dr									
Alignment Clearing				**2**					
10-Cu Dump Truck	NA	Diesel	3		Jun 2029	Jul 2029	NA	60	30
Boom Truck	NA	Diesel	5		Jun 2029	Jul 2029	NA	60	30
Chain Saws	1.9	Diesel	10		Jun 2029	Jul 2029	4	NA	30
Large Chipper	4.9	Diesel	5		Jun 2029	Jul 2029	4	NA	30
Blowers	1.8	Diesel	5		Jun 2029	Jul 2029	4	NA	30
Weed Wacker	1.7	Diesel	5		Jun 2029	Jul 2029	4	NA	30
Worker Commutes	NA	Gas	2		Jun 2029	Jul 2029	NA	60	30
Roads and Access				**4**					
10-Cu Dump Truck	NA	Diesel	1		Jul 2029	Jul 2029	NA	45	10
4,000 Gallon Water Truck	NA	Diesel	2		Jul 2029	Jul 2029	NA	50	25
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	1		Jul 2029	Jul 2029	NA	30	10
Lowboy Truck/Trailer	NA	Diesel	2		Jul 2029	Jul 2029	NA	30	4
Skid Steer	71	Diesel	1		Jul 2029	Jul 2029	5	25	10
325 Excavator	36	Diesel	1		Jul 2029	Jul 2029	5	45	10
Skip Loader	150	Diesel	1		Jul 2029	Jul 2029	5	NA	15
D6 Dozer	84	Diesel	1		Jul 2029	Jul 2029	5	NA	10
Fugitive Dust	NA	NA	NA		Jul 2029	Jul 2029	NA	NA	25
Worker Commutes (¾-Ton Pickup Truck)	NA	Gas	4		Jul 2029	Jul 2029	NA	50	25
Light Duty Truck	NA	Gas	1		Jul 2029	Jul 2029	NA	50	12
Guard Structures				**18**					
Digger Derrick Line Truck	NA	Diesel	2		Aug 2029	Feb 2030	NA	30	47
55-foot Bucket Truck	376	Diesel	1		Aug 2029	Feb 2030	8	NA	47
20,000 Pound Capacity Forklift	82	Diesel	1		Aug 2029	Feb 2030	8	NA	47
Super Framer 10 Wheel Flat Bed	NA	Diesel	1		Aug 2029	Feb 2030	NA	1	47
Heavy-Duty Vac Truck	NA	Diesel	2		Aug 2029	Feb 2030	NA	1	47

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Generator	14	Diesel	1		Aug 2029	Feb 2030	8	NA	47
Flasher Board for Traffic Control	6	Diesel	2		Aug 2029	Feb 2030	8	NA	47
Worker Commutes (Light-duty Auto)	NA	Gas	6		Aug 2029	Feb 2030	NA	50	47
Worker Commutes (Medium-duty)	NA	Diesel	8		Aug 2029	Feb 2030	NA	50	47
Worker Commutes (Light-duty)	NA	Gas	4		Aug 2029	Feb 2030	NA	50	47
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	6		Aug 2029	Feb 2030	NA	30	47
1-Ton Crew Cab Pickup	NA	Diesel	4		Aug 2029	Feb 2030	NA	30	47
Foundations				**7**					
10-Cu Dump Truck	NA	Diesel	1		Aug 2029	Feb 2030	NA	45	135
Auger Truck	83	Diesel	1		Aug 2029	Feb 2030	8	NA	15
10-Cu Concrete Mixer Truck	NA	Diesel	2		Aug 2029	Feb 2030	NA	75	15
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Aug 2029	Feb 2030	NA	30	135
Lowboy Truck/Trailer	NA	Diesel	1		Aug 2029	Feb 2030	NA	30	135
Skid Steer/Front Loader	71	Diesel	1		Aug 2029	Feb 2030	8	NA	135
Boom Truck	NA	Diesel	1		Aug 2029	Feb 2030	NA	15	135
Backhoe/Front Loader	84	Diesel	1		Aug 2029	Feb 2030	8	NA	135
Worker Commutes (Light-duty Auto)	NA	Gas	3		Aug 2029	Feb 2030	NA	10	135
Worker Commutes (Light-duty Auto)	NA	Gas	2		Aug 2029	Feb 2030	NA	10	135
Worker Commutes (Light-duty)	NA	Gas	2		Aug 2029	Feb 2030	NA	10	135
Structures Replacement				**7**					
Lowboy Truck/Trailer	NA	Diesel	3		Aug 2029	Feb 2030	NA	30	135
Truck - Framer (Crew Pick Up)	NA	Diesel	2		Aug 2029	Feb 2030	NA	25	135
F250 4X4 Crewcab (3/4 T) Foreman	NA	Diesel	2		Aug 2029	Feb 2030	NA	25	135
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Aug 2029	Feb 2030	NA	25	135
Hydro Seed Truck	NA	Diesel	1		Aug 2029	Feb 2030	NA	60	20
Truck Cranes - 20 - 30 Ton	367	Diesel	2		Aug 2029	Feb 2030	5	NA	135
100 - 280 Ton Crane	367	Diesel	3		Aug 2029	Feb 2030	8	NA	135

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Helicopter	NA	Diesel	3		Aug 2029	Feb 2030	5	NA	22
Worker Commutes (Light-duty Auto)	NA	Gas	3		Aug 2029	Feb 2030	NA	10	135
Worker Commutes (Light-duty Auto)	NA	Gas	2		Aug 2029	Feb 2030	NA	10	135
Worker Commutes (Light-duty Auto)	NA	Gas	2		Aug 2029	Feb 2030	NA	10	135
Transition Structures Estates/Park – South of Park				**7**					
Lowboy Truck/Trailer	NA	Diesel	3		Feb 2030	Feb 2030	NA	30	10
Truck - Framer (Crew Pick Up)	NA	Diesel	2		Feb 2030	Feb 2030	NA	25	10
F250 4X4 Crewcab (3/4 T) Foreman	NA	Diesel	2		Feb 2030	Feb 2030	NA	25	10
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Feb 2030	Feb 2030	NA	25	10
Truck Cranes - 20 - 30 Ton	367	Diesel	1		Feb 2030	Feb 2030	5	NA	10
100 - 280 Ton Crane	367	Diesel	1		Feb 2030	Feb 2030	8	NA	10
Worker Commutes (Light-duty Auto)	NA	Gas	3		Feb 2030	Feb 2030	NA	10	10
Worker Commutes (Light-duty Auto)	NA	Gas	2		Feb 2030	Feb 2030	NA	10	10
Worker Commutes (Light-duty Auto)	NA	Gas	2		Feb 2030	Feb 2030	NA	10	10
Transition Structures Estates/Park – North of Park				**7**					
Lowboy Truck/Trailer	NA	Diesel	3		Mar 2030	Mar 2030	NA	30	10
Truck - Framer (Crew Pick Up)	NA	Diesel	2		Mar 2030	Mar 2030	NA	25	10
F250 4X4 Crewcab (3/4 T) Foreman	NA	Diesel	2		Mar 2030	Mar 2030	NA	25	10
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Mar 2030	Mar 2030	NA	25	10
Truck Cranes - 20 - 30 Ton	367	Diesel	1		Mar 2030	Mar 2030	5	NA	10
100 - 280 Ton Crane	367	Diesel	1		Mar 2030	Mar 2030	8	NA	10
Worker Commutes	NA	Gas	3		Mar 2030	Mar 2030	NA	10	10
Worker Commutes	NA	Gas	2		Mar 2030	Mar 2030	NA	10	10
Worker Commutes	NA	Gas	2		Mar 2030	Mar 2030	NA	10	10
Transition Structures at Oakland X				**7**					
Lowboy Truck/Trailer	NA	Diesel	3		Apr 2030	Apr 2030	NA	30	20
Truck - Framer (Crew Pick Up)	NA	Diesel	2		Apr 2030	Apr 2030	NA	25	20

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
F250 4X4 Crewcab (3/4 T) Foreman	NA	Diesel	2		Apr 2030	Apr 2030	NA	25	20
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Apr 2030	Apr 2030	NA	25	20
Truck Cranes - 20 - 30 Ton	367	Diesel	1		Apr 2030	Apr 2030	5	NA	20
100 - 280 Ton Crane	367	Diesel	1		Apr 2030	Apr 2030	8	NA	20
Worker Commutes	NA	Gas	3		Apr 2030	Apr 2030	NA	10	20
Worker Commutes	NA	Gas	2		Apr 2030	Apr 2030	NA	10	20
Worker Commutes	NA	Gas	2		Apr 2030	Apr 2030	NA	10	20
Conductor Replacement				**28**					
Line Puller	82	Diesel	2		May 2030	Nov 2030	8	NA	133
Trailer-Mounted Tensioner	82	Diesel	2		May 2030	Nov 2030	8	NA	133
55-foot Bucket Truck	376	Diesel	4		May 2030	Nov 2030	7	NA	133
Transport of 55-foot Bucket Truck	NA	Diesel	4		May 2030	Nov 2030	NA	20	133
105-foot Bucket Truck	376	Diesel	2		May 2030	Nov 2030	7	NA	133
Transport of 105-foot Bucket Truck	NA	Diesel	2		May 2030	Nov 2030	NA	20	133
120-foot Crane Truck	376	Diesel	2		May 2030	Nov 2030	7	NA	133
Transport of 120-foot Crane Truck	NA	Diesel	2		May 2030	Nov 2030	NA	20	133
10,000 Pound Capacity Forklift	82	Diesel	1		May 2030	Nov 2030	7	NA	133
Transport of 10,000 Pound Capacity Forklift	NA	Diesel	1		May 2030	Nov 2030	NA	20	133
Generator	14	Diesel	2		May 2030	Nov 2030	7	NA	133
Transport of Generator	NA	Diesel	2		May 2030	Nov 2030	NA	20	133
Tractor Trailer (40-foot flatbed)	376	Diesel	1		May 2030	Nov 2030	5	NA	133
Transport of Tractor Trailer (40-foot flatbed)	NA	Diesel	1		May 2030	Nov 2030	NA	20	133
Light Ship Helicopter	NA	Diesel	3		May 2030	Nov 2030	6	NA	32
Medium-sized Ship Helicopter	NA	Diesel	3		May 2030	Nov 2030	6	NA	32
Worker Commutes	NA	Gas	10		May 2030	Nov 2030	NA	50	133
Worker Commutes	NA	Diesel	8		May 2030	Nov 2030	NA	50	133

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential							
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Worker Commutes	NA	Gas	10		May 2030	Nov 2030	NA	50	133
Truck - Light Duty Pickup	NA	Gas	8		May 2030	Nov 2030	NA	30	133
Crew Cab Heavy-Duty Pickup	NA	Diesel	6		May 2030	Nov 2030	NA	30	133
Restoration				**2**					
Flat Bed (plants to install)	NA	Diesel	1		Dec 2030	Nov 2032	NA	60	20
Crew Trucks	NA	Diesel	2		Dec 2030	Nov 2032	NA	60	20
Water Truck	NA	Diesel	1		Dec 2030	Nov 2032	NA	60	24
Worker Commutes - Dry Weather Monthly Insp.	NA	Gas	1		Dec 2030	Nov 2032	NA	60	6
Worker Commutes - Wet Weather Monthly Insp.	NA	Gas	1		Dec 2030	Nov 2032	NA	60	26
PG&E Rebuild Western Extent of Lines as Underground – West of Estates Dr									
Mobilization and Survey				**18**					
10-Cu Dump Truck (remove green waste from trees)	NA	Diesel	1		Aug 2028	Sep 2028	NA	60	3
Boom Truck (tree removal)	NA	Diesel	1		Aug 2028	Sep 2028	NA	60	3
Chain Saws	1.9	Diesel	2		Aug 2028	Sep 2028	4	NA	3
Large Chipper (12 inch diameter veg)	4.9	Diesel	1		Aug 2028	Sep 2028	4	NA	3
Utility Truck	NA	Diesel	1		Aug 2028	Sep 2028	NA	15	20
Delivery Vehicles	NA	Diesel	1		Aug 2028	Sep 2028	NA	15	20
Traffic Control Trucks	NA	Diesel	3		Aug 2028	Sep 2028	NA	50	10
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Aug 2028	Sep 2028	NA	15	10
1-Ton Crew Cab Flatbed, 4 × 4	NA	Diesel	2		Aug 2028	Sep 2028	NA	15	20
Lowboy Truck/Trailer	NA	Diesel	1		Aug 2028	Sep 2028	NA	2	10
Worker Commutes	NA	Gas	6		Aug 2028	Sep 2028	NA	50	30
Worker Commutes	NA	Gas	6		Aug 2028	Sep 2028	NA	50	30
Worker Commutes	NA	Gas	6		Aug 2028	Sep 2028	NA	50	30

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Vaults				**6**					
CAT 328 Excavator	36	Diesel	1		Sep 2028	May 2029	5	NA	120
CAT 928 Loader	84	Diesel	1		Sep 2028	May 2029	5	NA	120
JD 225 Excavator	36	Diesel	1		Sep 2028	May 2029	5	NA	120
RT 100 - Terex Rough Terrain Crane	367	Diesel	1		Sep 2028	May 2029	5	NA	120
2500 Dodge Ram Pickup	NA	Diesel	2		Sep 2028	May 2029	NA	50	120
3500 Dodge Ram Pickup	NA	Diesel	2		Sep 2028	May 2029	NA	50	120
T 880 Kenworth Dump Truck	376	Diesel	1		Sep 2028	May 2029	5	NA	120
Concrete Truck	376	Diesel	2		Sep 2028	May 2029	8	NA	120
Lowboy Truck/Trailer	NA	Diesel	1		Sep 2028	May 2029	NA	50	120
Worker Commutes	NA	Gas	6		Sep 2028	May 2029	NA	50	120
Trenching and Duct Bank				**24**					
CAT 450 Backhoe	84	Diesel	3		Sep 2028	Aug 2029	5	NA	240
CAT 928 Loader	84	Diesel	3		Sep 2028	Aug 2029	5	NA	240
JD 225 Excavator	36	Diesel	3		Sep 2028	Aug 2029	5	NA	240
Doosan Air Compressor 185 CFM	37	Diesel	3		Sep 2028	Aug 2029	5	NA	240
T 880 Kenworth Dump Truck	376	Diesel	3		Sep 2028	Aug 2029	10	NA	240
1500 Dodge Ram Pickup	NA	Diesel	3		Sep 2028	Aug 2029	NA	110	240
2500 Dodge Ram Pickup	NA	Diesel	3		Sep 2028	Aug 2029	NA	110	240
3500 Dodge Ram Pickup	NA	Diesel	3		Sep 2028	Aug 2029	NA	6	240
Ingersoll Rand DD 24 Roller	36	Diesel	1		Sep 2028	Aug 2029	10	NA	240
Volvo VNX 300 Tractor	376	Diesel	2		Sep 2028	Aug 2029	3	NA	240
350 kW Generator	14	Diesel	1		Sep 2028	Aug 2029	5	NA	60
3500 Dodge Ram Pickup	NA	Diesel	1		Sep 2028	Aug 2029	NA	6	60
Welding Machine	46	Diesel	1		Sep 2028	Aug 2029	4	NA	60
Boom Truck	NA	Diesel	1		Sep 2028	Aug 2029	NA	6	60
Concrete Truck	NA	Diesel	1		Sep 2028	Aug 2029	NA	60	90

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	**Fuel Type**	**Quantity**	**Workforce**	**Start Date**	**End Date**	**Daily Use (Hours)**	**Miles/Day**	**Total Days**
Worker Commutes	NA	Gas	24		Sep 2028	Aug 2029	NA	50	240
Cable Installation and Splicing				**32**					
3500 Dodge Ram Pickup	NA	Diesel	2		Jun 2029	Jan 2030	NA	50	55
Semi Tractor	376	Diesel	1		Jun 2029	Jan 2030	5	NA	34
Cable Winch	82	Diesel	1		Jun 2029	Jan 2030	5	NA	55
1500 Dodge Ram Pickup	NA	Diesel	2		Jun 2029	Jan 2030	NA	50	90
Cable Reel Cart	82	Diesel	1		Jun 2029	Jan 2030	5	NA	55
2 kW Generator	14	Diesel	1		Jun 2029	Jan 2030	10	NA	90
Vacuum Truck	NA	Diesel	1		Jun 2029	Jan 2030	NA	35	4
Worker Commutes	NA	Gas	32		Jun 2029	Jan 2030	NA	50	90
Cable System Commissioning and Testing				**32**					
3500 Dodge Ram Pickup	NA	Diesel	2		Feb 2030	Feb 2030	NA	50	15
1500 Dodge Ram Pickup	NA	Diesel	2		Feb 2030	Feb 2030	NA	50	15
Worker Commutes	NA	Gas	32		Feb 2030	Feb 2030	NA	50	15
Restoration and Paving				**18**					
Utility Truck	NA	Diesel	1		Feb 2029	Aug 2029	NA	50	25
Traffic Control Trucks	NA	Diesel	3		Feb 2029	Aug 2029	NA	50	25
Delivery Vehicles	NA	Diesel	1		Feb 2029	Aug 2029	NA	50	25
Drum Type Compactor	82	Diesel	1		Feb 2029	Aug 2029	5	NA	25
Road Grader	82	Diesel	1		Feb 2029	Aug 2029	5	NA	25
Street Sweeper	36	Diesel	1		Feb 2029	Aug 2029	5	NA	20
Road Paving Machine	82	Diesel	1		Feb 2029	Aug 2029	5	NA	20
Worker Commutes	NA	Gas	6		Feb 2029	Aug 2029	NA	50	25
Worker Commutes	NA	Gas	6		Feb 2029	Aug 2029	NA	50	25
Worker Commutes	NA	Gas	6		Feb 2029	Aug 2029	NA	50	25
Inspections				**2**					
Worker Commutes	NA	Gas	2		Sep 2028	Feb 2030	NA	50	25

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential							
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Inspector Vehicles	NA	Gas	2		Sep 2028	Feb 2030	NA	50	317
Truck Drivers/Hauling				14					
Material Haul Trucks	NA	Diesel	14		Sep 2028	Aug 2029	NA	50	122
Long Haul Dump Truck	NA	Diesel	1		Sep 2028	Aug 2029	NA	50	106
Replant/Water Landscape Trees				2					
Flat Bed (plants to install)	NA	Diesel	1		Sep 2029	Aug 2029	NA	60	10
Crew Trucks	NA	Gas	2		Sep 2029	Aug 2031	NA	60	10
Water Truck	NA	Diesel	1		Sep 2029	Aug 2031	NA	60	24
PG&E Removing Existing Structures and Conductors West of Estates Dr									
Alignment Clearing				**2**					
10-Cu Dump Truck	NA	Diesel	1		Mar 2030	Mar 2030	NA	60	3
Boom Truck (remove green waste)	NA	Diesel	1		Mar 2030	Mar 2030	NA	60	3
Chain Saws	1.9	Diesel	1		Mar 2030	Mar 2030	4	NA	3
Large Chipper (12 inch diameter veg)	4.9	Diesel	1		Mar 2030	Mar 2030	4	NA	3
Blowers	1.8	Diesel	1		Mar 2030	Mar 2030	4	NA	3
Weed Wacker	1.7	Diesel	1		Mar 2030	Mar 2030	4	NA	3
Worker Commutes	NA	Gas	2		Mar 2030	Mar 2030	NA	60	3
Structure Removals (Poles and Towers)				**7**					
Lowboy Truck/Trailer	NA	Diesel	3		Mar 2030	Apr 2030	NA	30	40
Truck - Framer (Crew Pick Up)	NA	Diesel	2		Mar 2030	Apr 2030	NA	25	40
F250 4X4 Crewcab (3/4 T) Foreman	NA	Diesel	2		Mar 2030	Apr 2030	NA	25	40
¾-Ton Pickup Truck, 4 × 4	NA	Diesel	2		Mar 2030	Apr 2030	NA	25	40
Truck Cranes - 20 - 30 Ton	367	Diesel	2		Mar 2030	Apr 2030	5	NA	40
100 - 280 Ton Crane	367	Diesel	3		Mar 2030	Apr 2030	8	NA	40
Worker Commutes	NA	Gas	3		Mar 2030	Apr 2030	NA	10	40
Worker Commutes	NA	Gas	2		Mar 2030	Apr 2030	NA	10	40
Worker Commutes	NA	Gas	2		Mar 2030	Apr 2030	NA	10	40

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Restoration				**2**					
Worker Commutes - Inspection	NA	Gas	1		May 2030	May 2030	NA	60	2
Flat Bed (plants to install)	NA	Diesel	1		May 2030	May 2030	NA	60	2
Crew Trucks	NA	Gas	2		May 2030	May 2030	NA	60	5
PG&E Construction Activities at Moraga Substation									
Equipment Delivery and Setup				**1**					
1-Ton Crew Cab Pickup (delivery)	NA	Diesel	1		Sep 2029	Sep 2029	NA	50	1
Equipment Installation				**5**					
Worker Commutes	NA	Gas	2		Sep 2029	Oct 2029	NA	50	40
Worker Commutes	NA	Gas	1		Sep 2029	Oct 2029	NA	50	40
Worker Commutes	NA	Gas	1		Sep 2029	Oct 2029	NA	50	40
Dress/Test/Wire Equipment									
Worker Commutes	NA	Gas	2		Nov 2029	Dec 2029	NA	50	40
Worker Commutes	NA	Gas	1		Nov 2029	Dec 2029	NA	50	40
Worker Commutes	NA	Gas	1		Nov 2029	Dec 2029	NA	50	40
Equipment Removal				**1**					
1-Ton Crew Cab Pickup (delivery)	NA	Diesel	1		Dec 2029	Dec 2029	NA	50	1
Inspections				1					
Worker Commutes	NA	Gas	1		Sep 2029	Dec 2029	NA	50	20
PG&E Construction Activities at Oakland X Substation									
Equipment Delivery and Setup				**5**					
Forklift	82	Diesel	1		Sep 2029	Sep 2029	8	NA	1
1-Ton Crew Cab Pickup (delivery)	NA	Diesel	1		Sep 2029	Sep 2029	NA	50	1
Worker Commutes	NA	Gas	2		Sep 2029	Sep 2029	NA	50	1
Worker Commutes	NA	Gas	1		Sep 2029	Sep 2029	NA	50	1
Worker Commutes	NA	Gas	1		Sep 2029	Sep 2029	NA	50	1

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 3.6-1. Anticipated Construction Equipment and Workforce

Equipment	Approximate Estimated or Potential								
	Horsepower	Fuel Type	Quantity	Workforce	Start Date	End Date	Daily Use (Hours)	Miles/Day	Total Days
Equipment Installation				**5**					
Worker Commutes	NA	Gas	2		Sep 2029	Dec 2029	NA	50	80
Worker Commutes	NA	Gas	2		Sep 2029	Dec 2029	NA	50	80
Worker Commutes	NA	Gas	1		Sep 2029	Dec 2029	NA	50	80
Dress/Test/Wire Equipment				**5**					
Worker Commutes	NA	Gas	2		Dec 2029	Jan 2030	NA	50	40
Worker Commutes	NA	Gas	2		Dec 2029	Jan 2030	NA	50	40
Worker Commutes	NA	Gas	1		Dec 2029	Jan 2030	NA	50	40
Equipment Removal				**1**					
1-Ton Crew Cab Pickup (delivery)	NA	Diesel	1		Jan 2030	Jan 2030	NA	50	1
Inspections				**3**					
Pickup Truck	NA	Gas	3		Jan 2030	Feb 2030	NA	50	40

3.6.3 Construction Traffic

Construction crews (worker commutes) will be traveling to and from the proposed sites via a light-duty auto/truck as detailed in Table 3.6-1. Worker daily commute trips are estimated at approximately 50 miles roundtrip for PG&E. Equipment will be staged onsite in a work area or brought to the work area daily on work trucks or trucks with trailers. Construction trip types are estimated in miles per day/vehicle by vehicle type and activity as detailed in Table 3.6-1.

Based on these assumptions, Table 3.6-2 is a summary of estimated vehicle trips and vehicle miles traveled (VMT) by trip type and project construction activity. Estimated vehicle trips are calculated with the daily trip count multiplied by days of use. Total VMT is estimated vehicle trips multiplied by miles/day/vehicle type.

Table 3.6-2. Estimated Construction Vehicle Trips and Vehicle Miles Traveled

Trip Type		Workers or Trucks	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Workers	Auto/Light Trucks (1.0 PCE)	109	218	109	0	109	0	109	109
	Medium/Heavy Trucks (2.0 PCE)	8	32	16	0	16	0	16	16
Light Trucks (1.0 PCE)		20	40	20	0	20	0	20	20
Medium/Heavy Trucks (2.0 PCE)		47	188	94	0	94	0	94	94
Total Construction Traffic in PCE			478	239	0	239	0	239	239

ADT = average daily traffic
PCE= passenger-car equivalent

For the purpose of this analysis, it is estimated that construction activities associated with rebuilding of the overhead lines, construction of the underground lines, and removal of the existing overhead lines will result in up to 47 large truck (line trucks, semi-trucks, concrete trucks, flatbeds, and cranes) trips per day and up to 20 transport vehicle (crew cab trucks, pickups, and other light-duty vehicles) trips per day.

3.6.4 Construction Schedule

The preliminary proposed schedule is presented in Table 3.6-3. Additional detail is provided in Table 3.6-1. Construction is anticipated to start in August 2028 and to be completed in July 2031. The approximately 35 months will conclude with the removal of the existing overhead lines west of Estates Drive. While the majority of site and roadway restoration is expected to complete with the construction activity at a work location, some restoration is expected to continue through December 2032.

Table 3.6-3. Preliminary Proposed Construction Schedule

Project Construction Activity	Proposed Schedule
CPUC Issues Permit to Construct to PG&E	August 2026
Initiate Notice to Proceed/Construction Begins	August 2028
Rebuild Western Extent of Lines as Underground (West of Estates Dr)	July 2028 through February 2030
Rebuild Lines Overhead and Remove Existing Lines (East of Estates Dr)	June 2029 through November 2030
Construction Activities at Moraga Substation	September 2029 through December 2029
Construction Activities at Oakland X Substation	September 2029 through February 2030
Replant/Water Landscape Trees (West of Estates Dr)	September 2029 through August 2031
In-service date	December 2030
Restoration (East of Estates Dr)	December 2030 through December 2032
Remove Existing Structures and Conductors (West of Estates Dr)	January 2031 through July 2031
Restoration (West of Estates Dr)	May 2030 through December 2032

Construction is scheduled to begin with the rebuilding of lines before moving into both substations. The underground portion is not limited by the existing energized power lines and will start at the same time the overhead rebuild will start. Line clearances will be scheduled throughout the project to deenergize the one or more circuits to provide a safe work area or to move or remove line components. Installation of the new foundations and removal of the old foundations may be conducted outside of the clearance windows for the conductors. The rebuilding of lines overhead is anticipated to occur over 18 months and the lines rebuilt underground will occur over 19 months. The rebuild of the overhead and underground portions will occur concurrently as feasible in anticipation of the in-service date scheduled for December 2030. Structure site restoration is expected to occur after each structure replacement.

Construction on the substations will begin approximately one year after the lines start. Construction at Moraga Substation will occur over 4 months. Construction of Oakland X Substation will occur over 6 months. Removal of existing structures where the lines are rebuilt underground is anticipated to be approximately 7 months. Restoration east of Estates Drive includes expected watering of replanted landscaping which could occur over a 24-month period whereas the restoration west of Estates Drive is only scheduled for 1 month. Replanting and watering landscape trees will occur over 24 months. Restoration efforts and the further removal of existing structures will occur concurrently over the following two years.

Overhead line construction schedule will be limited by line clearances, which are usually available for approximately 10 calendar days in cooler months with less power demand. Work outside of October/November through March/April will likely be limited to weekend clearances when demand typically is less and a line clearance can be scheduled.

Crews will be dispatched to structure locations as rights-of-way are available. Construction scheduling will be developed in keeping with landowner agreements and to minimize conflicts with existing land uses, such as those construction activities occurring in EBRPD and EBMUD properties, and construction activities in public roadways within the project footprint. Scheduling also may be affected by constraints related to bird nesting, environmental concerns, line clearances, weather, red flag warnings, school hours, and other factors. Wet weather may slow or pause work outside of paved areas. Wildlife constraints are not anticipated outside of potentially accommodating bird nesting. Preconstruction bird nesting surveys will occur during the typical bird nesting season, as described in the project APMs. Buffers for active nests will be incorporated into the 2-week look-ahead schedule, which will be maintained during construction and adjusted as needed. Refer to Appendix B6, Nesting Bird: Species-Specific Buffers for PG&E Activities.

3.6.5 Work Schedule

Construction typically will occur Monday through Saturday between 7:00 a.m. and 8:00 p.m. or during times that will be set through coordination with relevant jurisdictions and property owners. If work activities or required clearances on the power lines will cause traffic congestion or necessitate work outside of normal working hours, the project may require nighttime work or work on Sundays. Longer workday hours, Sunday work, and nighttime work may be required to support activities that need to continue to completion. These may include conductor-stringing activities, conductor splicing, work associated with the underground cable, unanticipated schedule delays, or preparation for inclement weather.

Work at the project staging areas and substations is anticipated to occur for the duration of the project, but there will be days when no activities will take place. Over the duration of the project, it is anticipated that on average work will occur for approximately 14 days at each structure location over approximately 4-6 months for structure replacement or reconductoring or structure and line removal. These workdays may be nonconsecutive.

Table 3.6-4. Estimated Approximate Construction Duration at Work Area Types

Project Construction Activity	Estimated Duration
Staging Areas outside of stations (up to approximately 21 areas or 16 acres)	22 months
Staging Areas in existing PG&E facilities	22 months
Helicopters Using Landing Zones in Eastern Section	22-23 days, nonconsecutive
Helicopter Flights Between Landing Zones/Airport and Eastern Section Work Areas	50 per day
Areas and Access Preparation including Guard Structures	< 1 day/structure on average
Structure Foundation	1-2 days/structure
Structure Assembly and Installation	1-2 days/structure
Transition Structure Installation	2-3 weeks
Structure Removal	1-2 days/structure
Landing Zones	< 0.25 day/structure
Conductor Reconductoring	1-2 days/structure
Tension Pull Sites	2 weeks/site
Underground Vault Installation	2 weeks/vault
Underground Duct Bank Installation	40-100 linear feet/day
Underground Cable Pulling Adjacent Vaults	15 days
Vault Racking and Splicing	7 days
Transition Structure Commissioning	2 weeks
Drone Use in Central and Eastern Sections	2 weeks
Restoration	<1 day/structure on average
Moraga Substation – equipment review and replacement	4 months
Oakland X Substation – equipment review and replacement	6 months

3.7 Post-Construction

3.7.1 Configuring and Testing

The project will use the testing procedures recommended by the Institute of Electrical and Electronics Engineers and the equipment manufacturers and no special process is planned for configuring and testing. The estimated equipment, duration of work, and personnel requirements for testing are presented in Table 3.6-1. After 115 kV equipment testing, end-to-end testing, and SCADA testing have been completed, the hybrid lines will be energized. All necessary clearances will be coordinated by PG&E.

3.7.2 Landscaping

No new landscaping is planned. Both Moraga and Oakland X substations will require no landscaping plans since the project will not affect existing landscaping at either site. Replanting existing landscaping impacted by construction will be done in coordination with the property owner, as discussed under Section 3.7.3.2.

3.7.3 Demobilization and Site Restoration

3.7.3.1 Demobilization

As work is completed at each work site, the surplus materials, equipment, and construction debris located at the site will be collected and removed. All project construction debris will be removed and recycled or disposed of at permitted landfill sites, as appropriate. Cleared vegetation will be mulched and left onsite or removed as identified in the landowner agreement.

3.7.3.2 Site Restoration

Following their use, equipment, surplus materials, matting, and supplies will be removed and work sites will be returned to conditions that allow for preproject land uses. All site improvements will be subject to conditions stipulated in easements obtained from landowners. If the grade or topography was altered during project activities, final grading will restore contours in keeping with those of the surrounding area and natural drainage patterns. Each site will be returned to preproject conditions or as specified in landowner agreements. BMPs will be installed, inspected, and maintained according to the SWPPP, as necessary to stabilize disturbed soils. Crews will conduct a final survey to document that cleanup activities have been successfully completed as required.

As part of the final construction activities, PG&E will restore disturbed areas, repave removed or damaged paved surfaces, restore landscaping or vegetation as necessary, and clean up the job site.

Restoration will be done in compliance with the locally issued ministerial permits and is based on matching the roadway's existing subbase and surface (asphalt, concrete, or a combination of both). After backfilling a duct bank trench or vault excavation, a road base backfill or slurry concrete cap will be installed and a pavement surface will be laid where the trench or excavation occurred. The edges of the pavement surface will be leveled to match the existing adjacent pavement surface. If the initial pavement surface is cold patch asphalt, then it will act as a temporary layer to return the road to service per ministerial permit conditions. Temporary cold patch asphalt will be removed before the final road pavement surface is installed. Final pavement surface restoration will use hot mix asphalt, concrete, or a combination of both depending on the ministerial permit conditions. Repaving and striping will be completed sequentially as completed sections of road surface are being restored, and this process will continue until the pavement restoration activity is complete.

Many of the project areas are in developed and urban areas that are paved or disturbed and free of vegetation or have urban landscaping. Vegetated areas disturbed by project activities will be restored to conditions equal to or better than preconstruction conditions. These may include limited street or landscaped areas that will be replanted according to an agreement with the city or property owner. PG&E will work with the city to replace landscape-affected properties with vegetation that is compatible with the rebuilt PG&E facilities.

Restoration of non-landscaped vegetated areas will be conducted through seeding of disturbed areas with a habitat-appropriate native seed mix, or other seed mix approved by the relevant property owner. Trucks are used to transport plants or seed mix to the restoration location. As needed, watering is estimated to occur for up to two years. Removal of gravel in areas where it has been laid down will be coordinated with the relevant property owner. In some cases, the gravel may remain in place; in others, it may be removed during post-project restoration.

3.8 Operation and Maintenance

Following construction of the project, operation and maintenance activities will consist of routine inspection, repair, and maintenance activities, which will be conducted as they are under existing conditions for existing facilities modified as part of this project.

3.8.1 Regulations and Standards

PG&E is a public utility and the operation of its project will be regulated by the CPUC. For the affected PG&E facilities, through the course of following detailed engineering and design, PG&E will identify and document changes as follows:

- O&M activities
- Assets
- Guidance documents
- Organizational structure
- Suppliers and contractors
- Tools and equipment

The following regulations and standards guide PG&E's operation and maintenance activities for electric lines, substations, and communication systems:

- CPUC GO 95 regulates all aspects of design, construction, operation, and maintenance of electrical power lines and fire safety hazards for utilities subject to CPUC jurisdiction.
- CPUC GO 128 applies to the construction of underground electric and communication lines to promote and safeguard public health and safety.
- CPUC GO 165 applies to all electric distribution and transmission facilities (excluding those facilities contained in a substation) subject to CPUC jurisdiction and orders additional inspection requirements beyond GO 95 to maintain a safe and reliable electric system.
- CPUC GO 174 regulates substation inspection programs for utilities subject to CPUC jurisdiction to promote the safety of workers and the public and enable adequacy of service.
- California Independent System Operator (CAISO) Transmission Owner Maintenance Practices for Electrical Substations, and NERC PRC-005-2, "Protection System Maintenance," supply applicable guidance for maintenance procedures.

Vegetation management is performed to maintain the required safety buffer in accordance with:

- Federal Energy Regulatory Commission Order No. 777
- NERC Standard FAC-003-4, which establishes vegetation management standards for electric transmission lines, also applies to maintenance.
- California Public Resource Code 4292-4293 and 4295.5 address fire hazard reduction for electric lines and establish minimum clearances.
- CPUC GO 95, Rule 35, and Rule 37, and Section III

PG&E's 2023-2025 Wildfire Management Plan[4] is developed in compliance with California SB 901, AB 1054, and guidelines from the California Office of Energy Infrastructure Safety. Revision 4 was submitted to the California Office of Energy Infrastructure Safety on January 8, 2024. The 2023-2025 plan addresses the following:

- PG&E's wildfire safety programs and initiatives focused on reducing the potential for catastrophic wildfires related to electrical equipment
- Reducing the potential for fires to spread
- Containing the customer impact of Enhanced Powerline Safety Settings (EPSS)/Public Safety Power Shutoff (PSPS) events

[4] https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program.html#tabs-d12abf1841-item-caaebaf89b-tab

PG&E's EPSS[5] transmission line protection devices reduce the time it takes for line protective devices such as circuit breakers and line reclosers to deenergize a power line when a fault occurs. These settings are in high fire risk and surrounding areas. Power lines automatically turn off power within one-tenth of a second when EPSS protection devices identify a fault. These faults may occur from vegetation striking a line, animal interference, third-party interference (for example, a vehicle hitting a line), or equipment failure. EPSS does not cause a power outage. These settings help protect customers and communities from potential ignitions that could result in wildfires by deenergizing the line when a fault is detected on a power line.

This more rapid response can prevent potential wildfire ignitions. In 2022, there was a 68 percent reduction on EPSS-enabled powerlines in CPUC-reportable ignitions in High Fire-Threat Districts on distribution powerlines (compared to the weather-normalized 2018-2020 average). By stopping ignitions, it helps prevent wildfires from starting and spreading. In 2022, despite dry conditions, there was a 99 percent decrease in acres impacted by ignitions as measured by fire size from electric distribution equipment (compared to the 2018-2020 average).

A PSPS[6] event occurs in response to severe weather. Severe weather, such as high winds, can cause trees or debris to damage equipment. If there is dry vegetation, this could lead to a wildfire. During these conditions, power is turned off to help prevent ignition of a wildfire. After the severe weather has passed, PG&E inspects power lines and restores power after equipment inspections are completed and any weather damage repaired. Typically, distribution lines are part of a PSPS event. The project lines have not been part of a PSPS event.

Refer to Section 5.20, Wildfire, for more discussion about applicable fire prevention regulations and standards.

3.8.2 System Controls and Operation Staff

The power lines and substations associated with the project are existing facilities, with operations controlled remotely from PG&E's Vacaville Control Center, near Vacaville, California. Monitoring and control functions for the new telecommunication wire colocated on the power lines will be connected to the existing PG&E transmission energy management system. The existing power lines will be monitored and protected by sets of relays located in Moraga and Oakland X substations at each end of each circuit. The required constant communication between protective relays at each end will be over redundant communication paths. The relays also are connected into PG&E's SCADA system. Data collection devices for the SCADA system typically include remote terminal units, microprocessor relays, data concentrators, and fault recorders. The devices will be capable of storing data for download via local and/or remote access. Any alarms resulting from relay actions will be promptly annunciated at PG&E's grid control center located in Vacaville, California. In the event of an alarm, required corrective actions can be initiated quickly by operators on round-the-clock duty at the grid control center. No new full-time staff will be required for operation and maintenance of the project.

3.8.3 Inspection Programs

PG&E routinely inspects power line structures and substations to verify stability, structural integrity, and the condition of components, including hardware, insulators, conductors, and equipment (fuses, breakers, relays, cutouts, switches, transformers, paint). The existing power lines are inspected in accordance with PG&E's Electrical Transmission Line Inspection and Preventative Maintenance Program[7], in the latest revision, as filed with the CAISO, includes inspection practices which are detailed in PG&E's Electric Transmission Preventative Maintenance Manual[8]. The PG&E power line inspection

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[5] https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program/enhanced-powerline-safety-settings.html

[6] https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program/public-safety-power-shutoffs.html

[7] https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/TD-1001S.pdf

[8] https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/td-1001m-etpmm.pdf

process involves three types of detailed inspections: (1) ground inspections; (2) aerial inspections; and (3) climbing that looks for abnormalities or circumstances that will negatively impact safety, reliability, or asset life. Ground inspections are performed visually by an inspector on the ground. Aerial inspections are performed via drone, helicopter, or aerial lift, with desktop image review. Climbing inspections are performed visually by an inspector climbing the structure. The existing lines are inspected annually by existing operation and maintenance crews, currently rotating between inspections, or as needed when driven by an event, such as an emergency or as identified by output from PG&E's Wildfire Transmission Risk Model. Infrared inspections are performed via helicopter and are conducted simultaneously with corona inspections to proactively identify asset conditions that could result in an ignition. Detailed ground, aerial, or climbing occur on a 3-year cycle unless modeling indicates the need for a greater frequency. If a detailed inspection is not scheduled, then a patrol inspection occurs. A patrol inspection is a visual review of the asset condition by vehicle or helicopter to detect imminent or existing safety or reliability hazards.

Ongoing inspections of these lines will continue while the proposed project is being considered by the CPUC. If ongoing inspections find issues that are best remedied by replacing or eliminating existing structures, PG&E will follow the appropriate process to address those issues to enable continued safe line operation.

Typically, there are no O&M inspections conducted on a new power line for the first 5 years following the in-service date. Rebuilt line inspections will include routine and detailed ground inspections for the underground portion of the hybrid lines. Inspections include the underground line, termination, and cable inspections summarized as follows:

- Routine – Quarterly visual inspections of terminals
- Detailed – Once every 2 years, visual inspection of the XLPE lines and energized vaults and infrared inspection of the terminations to detect hot spots

Regular routine inspections by substation personnel occur in accordance with PG&E's CAISO *Transmission Owner Maintenance Practices for Electrical Substations* and NERC PRC005-2, *Protection System Maintenance*, latest revision, or as needed under emergency conditions or for corrective maintenance. Current ongoing substation routine operations inspection activities are sufficient, and no additional activities will be required for the proposed project.

Detailed ground, aerial and climbing power line inspections occur on a 3-year cycle. As of 2023, PG&E introduced a staggered approach to ground and aerial inspections leaving less time between inspections throughout the 3-year baseline cycle. Infrared and corona inspections are completed on high fire threat district (HFTD) Tier 3 lines annually and on HFTD Tier 2 lines at least once every 3 years.

Existing O&M crews are sufficient to complete the inspection processes on the rebuilt lines and substations with minor modifications. Existing overhead power line inspections typically are performed by either vehicle, helicopter or drone and will continue using the same methods, crew, and access for the rebuilt power lines. For ground and climbing inspections, structures are accessed from existing roads or may require off-road travel using existing access, either in vehicles or on foot depending on weather and soil conditions. Transmission patrols may occur on foot or by vehicle based on the terrain or by helicopter. Underground line inspections are expected to occur from roadways or at nearby terminal locations that can be accessed by walking. Access to underground lines or vaults will include traffic control support to open vault covers within roadways. Substations will continue to be accessed by vehicles on existing roads and walking to inspection points within each substation.

3.8.4 Maintenance Programs

Routine maintenance of the power lines and substations will be performed to correct conditions identified during inspections. A field inspector must complete all possible minor/incidental repairs or replacements to correct abnormal conditions that can be performed safely by an individual during the inspection. For abnormal conditions not corrected during the inspection, the field inspector prepares a risk-based notification of the required maintenance activity. For example, insulators are not washed as part of regular maintenance unless inspections determine it is necessary. Scheduled maintenance or facility replacement after the designated lifespan of the equipment will vary by equipment type and will follow procedures at that time. The rebuilt power line parts do not typically require regular maintenance as indicated by the inspection frequency.

Site-specific conditions will create different rates of corrosion which will be observed during regular inspections and maintenance will be scheduled accordingly. Maintenance will include replacing the cathodic protection components such as a corroded galvanic anode. Current ongoing routine maintenance activities are sufficient, including existing access road maintenance, and no additional activities will be required under the proposed project. PG&E facilities will not be color treated and no landscaping is planned; no color maintenance or landscaping maintenance will be required.

In addition, to regular maintenance, these facilities sometimes are damaged by storms, floods, vandalism, or accidents; these require immediate repair. Emergency repair operations will involve the prompt deployment of crews and necessary equipment to repair and replace damaged facilities. In addition, PG&E manages an ongoing inventory of critical spare parts for electric line and substation equipment, in case of emergencies.

3.8.5 Vegetation Management Program

PG&E inspects all trees and shrubs near power lines and substation annually to ensure those that pose a safety concern are addressed[9]. High fire-threat locations are inspected more than once a year to ensure trees are a safe distance from the lines. PG&E's transmission reliability program is designed to improve reliability and reduce fire risk by clearing incompatible vegetation from the full width of the right-of-way. Routine vegetation management includes clearing around structures to allow for the inspections of the structure bases and footings. Patrols and inspections look for vegetation around structures. If woody vegetation is in contact with the structure, or significantly interferes with the inspection of the structure base or footings, then appropriate vegetation work is scheduled.

At least annually, PG&E will perform the following tasks:

- Prune trees to meet or exceed state vegetation and fire safety standards.
- Cut down dead or dying trees.
- Prune or remove trees so crews can install stronger, more-resilient equipment.
- Perform additional safety work in high fire-threat areas to address vegetation near electric structures and power lines.

In addition to annual tree work, in high fire-threat areas, PG&E will do the following:

- Use its wildfire risk model to identify trees that may cause a power outage or start a fire.
- Use trained and certified arborists to determine which trees near power lines need to be prunes or removed for safety.
- Trim or remove trees in areas that historically experienced a high volume of tree-related outages.

Current ongoing vegetation management programs are sufficient for the powerlines, substations, and access roads, and no additional activities will be required under the proposed project. Vegetation management will not be required to continue where the overhead lines are removed after being rebuilt in an underground configuration. Vegetation management will not be required for the underground portion proposed to be in city streets.

[9] https://www.pge.com/en/outages-and-safety/safety/vegetation-management.html

In 2023, PG&E restructured its Vegetation Management Program based on a risk-informed approach to three new risk-informed vegetation management programs[10]. The areas where enhanced vegetation management is conducted are as follows:

- Focused Tree Inspections: In specific areas of focus, primarily in the High Fire Risk Areas, efforts are concentrated to inspect and address high-risk locations, such as those that have experienced higher volumes of vegetation damage during PSPS events, outages, and/or ignitions.
- Vegetation Management for Operational Mitigations: This program is intended to help reduce outages and potential ignitions using a risk informed, targeted plan to mitigate potential vegetation contacts based on historic vegetation caused outages on EPSS-enabled circuits. Initial focus will be on mitigating potential vegetation contacts in circuit protection zones that have experienced vegetation caused outages. Scope of work will be developed by using EPSS and historical outage data and vegetation failure from the Wildfire Distribution Risk Model version 3 risk model. Vegetation outage extent of condition inspections conducted on EPSS-enabled devices may generate additional tree work.
- Tree Removal Inventory: This is a long-term program intended to systematically work down trees that were previously identified through certain inspections. PG&E is developing annual risk-ranked work plans to mitigate the highest risk-ranked areas first and will continue monitor the condition of these trees through its established inspection programs.

3.9 Decommissioning

3.9.1 Decommissioning

At this time, it is difficult to predict precisely when or how the proposed project will be decommissioned at the end of the project's useful life. At the time of decommissioning, PG&E will review and consider current options, issues, and regulatory requirements in consultation with landowners, occupants, government representatives, and other participants having interest in the proposed work.

3.10 Anticipated Permits and Approvals

3.10.1 Anticipated Permits and Approvals

PG&E will obtain all applicable permits for the project from federal, state, and local agencies. Table 3.10-1 provides the potential permits and approvals that may be required for project construction.

Table 3.10-1. Permits and Approvals that May Be Required

Permit/Authorization	Agency	Purpose
Federal		
None		
State		
National Pollutant Discharge Elimination System – General Construction Stormwater Permit	Bay Area Regional Water Quality Control Board	Stormwater discharges associated with construction activities disturbing more than 1 acre of land
Encroachment Permit	California Department of Transportation	Installation of temporary guard structures in Caltrans right-of-way and netting across SR 13 during construction

[10] https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/pge-wmp-r4-010824.pdf

Table 3.10-1. Permits and Approvals that May Be Required

Permit/Authorization	Agency	Purpose
Local		
Encroachment Permit	Contra Costa County City of Orinda City of Piedmont	Conductor installation over/along county or city roads, including traffic controls; temporary construction areas
Temporary Park Access Permit	East Bay Regional Park District	Minor modifications to and use of existing fire roads; temporary construction areas, including helicopter landing zones
Excavation Permit	City of Oakland	Potholing and trenching/ excavation in city streets

3.10.2 Rights-of-Way or Easement Applications

Land entitlement issues are not part of this regulatory proceeding, in which the CPUC is considering whether to grant or deny PG&E’s application for a permit to construct new electrical facilities. Rather, any land rights issues will be resolved in subsequent negotiations and/or condemnation proceedings in the proper jurisdiction, following the decision by the CPUC on PG&E’s application (for example, refer to Jefferson-Martin 230 kV Transmission Project, A.02-04-043, D.04-08-046, p. 85).

3.11 Applicant-Proposed Measures

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
Section 5.1 Aesthetics (AES)
APM Aesthetics-1 (AES-1): Aesthetics Impact Reduction During Construction. All project sites will be maintained in a clean and orderly state. Nighttime lighting will be directed away from residential areas and have shields to prevent light spillover effects. Upon completion of project construction, project staging and temporary work areas will be returned to pre-project conditions, including regrading of the site and revegetating or repaving of disturbed areas to match pre-existing contours and conditions.
APM AES-2: Use of Dulled Galvanized Finish or Corten Steel on Replacement Structures and Non-Specular Conductors. Use of a factory-dulled galvanized finish or Corten steel on replacement power line structures and non-specular (nonreflective) conductors will reduce the potential for a new source of glare and visual contrast resulting from the project.
Section 5.2 Agriculture and Forestry Resources (AGR)
APM AGR-1: Minimize Impacts on Active Agricultural Areas. ▪ Prior to construction, PG&E will provide written notice to agricultural landowners outlining construction activities, preliminary schedule, and timing of restoration efforts. ▪ PG&E will coordinate with landowners to minimize construction-related disruptions to grazing operations. To the extent reasonably feasible, PG&E will schedule construction activities to minimize disruptions to grazing. ▪ PG&E will restore grazing land temporarily impacted by construction to preproject conditions following completion of construction, including areas impacted by establishment of temporary staging, laydown and storage areas, overland access, guard structures, and pull sites. The responsibility of performing these various tasks may be stipulated in an agreement between PG&E and the landowner.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
Section 5.3 Air Quality (AIR)
APM AIR-1: Dust Control During Construction Pacific Gas and Electric Company (PG&E) will implement measures to control fugitive dust consistent with BAAQMD's Basic Best Management Practices (BMPs) (BAAQMD 2023) as follows: ▪ All exposed surfaces within the active construction area (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day as necessary to contain dust. ▪ All haul trucks transporting soil, sand, or other loose material offsite will be covered. ▪ All visible mud or dirt trackout onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. ▪ All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph). ▪ All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. ▪ All grading activities shall be suspended when average wind speeds exceed 20 mph. If excavating soils when average wind speeds exceed 20 mph, soil piles will be lightly sprayed with water to contain dust to the work area. ▪ Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations. Where project activities are within 1,000 feet of residential areas, PG&E will also implement the following additional BMPs, consistent with BAAQMD's Enhanced BMPs (BAAQMD 2023): ▪ Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities. ▪ Minimize the amount of excavated material or waste materials stored at the site. ▪ Stabilize soil where project grading occurred and the area is inactive for at least 14 calendar days. Soil stabilization measures may include wood mulch, gravel, seeding or application of other non-toxic soil stabilizer consistent with APM HYD-1.
APM AIR-2: Asbestos Management. If any load-bearing structure (poles, towers, concrete pads) is to be removed, this project will require asbestos testing and notification to BAAQMD. Notify the Environmental Field Specialist (EFS) at least 45 days prior to work commencing. BAAQMD must be notified at least 10 working days prior to work (demolition) commencing. If the construction start date changes, notify the EFS immediately as notification to BAAQMD may need to be resubmitted. EFS is responsible for obtaining any necessary permits from BAAQMD prior to the start of work.
APM AIR-3: Minimize Construction Equipment Exhaust. PG&E will minimize construction equipment exhaust as follows: Use low-emission or electric construction equipment where feasible. Ensure that cranes, off-highway trucks, and tractors/loaders/backhoes used during project construction will comply with Tier 4 emissions standards, pending availability. Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time will depend on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following startup that limit their availability for use following startup. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction supervisors will include briefings to crews on vehicle use as part of preconstruction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use.
Section 5.4 Biological Resources (BIO)
Field Protocols from the BAHCP
FP-01: Hold annual training on habitat conservation plan requirements for employees and contractors performing covered activities in the HCP Plan Area that are applicable to their job duties and work.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
FP-02: Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
FP-03: Use existing access and ROW roads. Minimize the development of new access and ROW roads, including clearing and blading for temporary vehicle access in areas of natural vegetation.
FP-04: Locate off-road access routes and work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).
FP-05: Notify a conservation landowner at least 2 business days prior to conducting covered activities on protected lands (state and federally owned wildlife areas, ecological reserves, or conservation areas); more notice will be provided if possible or if required by other permits. If the work is an emergency, as defined in PG&E's Utility Procedure ENV-8003P-01, PG&E will notify the conservation landowner within 48 hours after initiating emergency work. While this notification is intended only to inform the conservation landowner, PG&E will attempt to work with the conservation landowner to address landowner concerns.
FP-06: Minimize potential for covered species to seek refuge or shelter in pipes and culverts. Inspect pipes and culverts of diameter wide enough to be entered by a covered species that could inhabit the area where pipes are stored for wildlife species prior to moving pipes and culverts. Immediately contact a biologist if a covered species is suspected or discovered.
FP-07: Vehicle speeds on unpaved roads will not exceed 15 miles per hour [mph].
FP-08: Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.
FP-09: During fire season in designated State Responsibility Areas, equip all motorized equipment with federally approved or state-approved spark arrestors. Use a backpack pump filled with water and a shovel and fire-resistant mats and/or windscreens when welding. During fire "red flag" conditions, as determined by the California Department of Forestry and Fire Protection, curtail welding. Each fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C. Clear parking and storage areas of all flammable materials.
FP-10: Minimize the activity footprint and minimize the amount of time spent at a work location to reduce the potential for take of species.
FP-11: Utilize standard erosion and sediment control best management practices (BMPs) (pursuant to the most current version of PG&E's *Stormwater Field Manual for Construction Best Management Practices*) to prevent construction site runoff into waterways.
FP-12: Stockpile soil within established work area boundaries and locate stockpiles so as not to enter water bodies, stormwater inlets, other standing bodies of water. Cover stockpiled soil prior to precipitation events
FP-13: Fit open trenches or steep-walled holes with escape ramps of plywood boards or sloped earthen ramps at each end if left open overnight. Field crews will search open trenches or steep-walled holes every morning prior to initiating daily activities to ensure wildlife are not trapped. If any wildlife are found, a biologist will be notified and will relocate the species to adjacent habitat or the species will be allowed to naturally disperse, as determined by a biologist.
FP-14: If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial weed-free seed mix.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
FP-15: Prohibit vehicular and equipment refueling 250 feet from the edge of vernal pools and 100 feet from the edge of other wetlands, streams, or waterways. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. Maintain spill prevention and cleanup equipment in refueling areas.
FP-16: Maintain a buffer of 250 feet from the edge of vernal pools and 50 feet from the edge of wetlands, ponds, or riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the land planner, biologist, or HCP administrator to minimize impacts by flagging access, requiring foot access, restricting work until dry season, or requiring a biological monitor during the activity.
FP-17: Directionally fell trees away from an exclusion zone[11] if an exclusion zone has been defined. If this is not possible, remove the tree in sections. Avoid damage to adjacent trees to the extent possible. Avoid removal of snags and conifers with basal hollows, crown deformities, and/or limbs over 6 inches in diameter.
FP-18: Nests with eggs and/or chicks will be avoided. Contact a biologist, land planner, or the Avian Protection Program manager for further guidance.
Species-specific Avoidance and Minimization Measures from the BAHCP
AMM Wetland-2: Identify wetlands, ponds, and riparian areas and establish buffers. Maintain a buffer of 50 feet around wetlands, ponds, and riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the biologist or HCP administrator to minimize impacts. These measures include flagging access, requiring foot access, restricting work until the dry season, requiring a biological monitor during the activity, or excavating burrows in ROWs where trenching will occur. Activities must maintain the downstream hydrology to the wetland, pond, or riparian area. Additional minimization measures may be implemented with prior concurrence from USFWS.
AMM Plant-01: No herbicides will be used for vegetation management, pole clearing, or any other purpose within 100 feet of an MBZ (except vegetation management's direct application to cut stumps when greater than 25 feet from an MBZ and in conformance with applicable pesticide regulations).
AMM Plant-02: Heavy equipment shall remain on access roads or other previously disturbed areas unless otherwise prescribed by a land planner, biologist, or HCP administrator.
AMM Plant-03: Stockpile separately the upper 4 inches of topsoil during excavations associated with covered activities. Stockpiles topsoil will be used to restore the disturbed ROW.
AMM Plant-04: When covered activities greater than 0.1 acre in size within a MBZ will have direct impacts on covered species, work with the crew to place flagging, fencing, or other physical exclusion barriers to minimize disturbances. If the work will directly impact covered plant species, implement AMMs Plant-05, -06, -07, and -08.
AMM Plant-05: If a covered plant species is present and it cannot be avoided, PG&E will salvage plant material (i.e., seeds, cuttings, whole plants) and prepare a restoration plan that details the handling, storage, propagation, or reintroduction to suitable and appropriate habitat subject to USFWS review and approval.

[11] Per the BAHCP, an exclusion zone is an area marked with fencing, signage, stakes, or flagging. Exclusion zones are "do not enter" areas, except as instructed by a biologist or the BAHCP Administrator. The exclusion zone distance is a guideline that may be modified by the biologist, based on site-specific conditions (including, but not limited to, habituation by the species or background disturbance levels) (see also ITP FEIR APM BIO-7, Table 5.4-12).

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
AMM Plant-06: If a covered annual plant species is present and it cannot be avoided, conduct covered activities after seeds have matured to the extent possible
AMM Plant-07: If a covered perennial plant species is present and it cannot be avoided, conduct covered activities after seeds have matured to the extent possible. Minimize disturbance to the below-ground portions of the plants (e.g., roots, bulbs, tubers).
AMM Plant-08: PG&E will prune shrubs in a manner that promotes resprouting. If permanent impacts are unavoidable, establish new individuals by planting seedlings or from cuttings in adjacent suitable habitat. PG&E will implement best management practices [BMPs] including vehicle, equipment, and personnel hygiene protocols; procedures for conducting activities in infected areas; and timing restrictions that avoid working when soils are moist and the likelihood of spreading *Phytophthora cinnamomi* is greatest.
CDFW Measures from the Bay Area O&M ITP
5.3: Biological Monitor Authority. To ensure compliance with the Conditions of Approval of this ITP, all Designated Biologists and General Biological Monitors shall immediately stop any activity, when safe to do so, that does not comply with this ITP and/or order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species. PG&E shall provide unfettered access to each Work Area and otherwise facilitate the Designated Biologists and General Biological Monitors in the performance of his/her duties. If a Designated Biologist or General Biological Monitor are either unable to comply with the ITP or prevented from performing required ITP compliance, then they shall notify the CDFW Representative immediately. PG&E shall not enter into any agreement or contract of any kind, including but not limited to non-disclosure agreements and confidentiality agreements, with its contractors and/or Designated Biologists or Biological Monitors that prohibit or impede open communication with CDFW, including but not limited to providing CDFW staff with the results of any surveys, reports, or studies or notifying CDFW of any non-compliance or take. Failure to notify CDFW of any non-compliance or take or injury of a Covered Species as a result of such agreement or contract may result in CDFW taking actions to prevent or remedy a violation of this ITP.
5.4: Education Program. PG&E shall conduct an education program for all persons employed or otherwise working in the Project Area before performing any work. The program shall consist of a presentation from the Designated Biologist or General Biological Monitor that includes a discussion of the biology and general behavior of the Covered Species, information about the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, its status pursuant to CESA including legal protection, recovery efforts, penalties for violations and Project specific protective measures described in this ITP. PG&E shall provide interpretation for non-English speaking workers, and the same instruction shall be provided to any new workers before they are authorized to perform work in the Project Area. Upon completion of the education program, employees or contractors shall sign a form or equivalent acknowledging that they attended the program and understand all protection measures. This training shall be repeated at least once annually for long-term and/or permanent employees or contractors that shall be conducting work in the Project Area.
5.5: Covered Activity Monitoring Documentation. When biological monitoring is required per Condition of Approval 6.4 (Compliance Monitoring) or when required for conducting Covered Activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement) and minor new construction in modeled habitat, the Monitoring Biologist(s) shall maintain monitoring documentation onsite in either hard copy or digital format throughout the duration of work, which shall include a copy of this ITP with attachments. PG&E shall ensure a copy of the monitoring documentation is available for review at the Work Area upon request by CDFW.
5.6: Trash Abatement. PG&E shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. PG&E shall ensure that trash and food items are contained in animal-proof containers and removed, ideally at daily intervals but at least once a week, to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
5.7: Dust Control. PG&E shall implement dust control measures during construction activities to facilitate visibility for monitoring of the Covered Species by Biological Monitors and crews. PG&E shall keep the amount of water used to the minimum amount needed and shall not allow water to form puddles.
5.8: Prohibition of Firearms. Firearms and domestic dogs shall be prohibited in work areas as well as from site access routes during construction and development of the project, except those firearms and domestic dogs that are in the possession of authorized security personnel or local, state, or federal law enforcement officials.
5.9: Erosion Control. PG&E shall implement and install all erosion and sediment control measures and devices prior to conducting Covered Activities that include grading, excavation, or placement of fill. PG&E shall utilize erosion control measures where sediment runoff from exposed slopes or surfaces could enter a drainage, stream, wetland or pond. PG&E shall repair and/or replace ineffective measures or contrivances whose integrity has been compromised immediately.
5.10: Erosion Control Materials. PG&E shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as monofilament netting (erosion control matting) or similar material, in potential Covered Species' habitat.
5.11: Clean Vehicles. PG&E shall implement the following: 5.11.1 Mud and/or accumulated soils shall be removed from equipment and vehicles to the maximum extent practicable. 5.11.2. Vehicles and equipment shall be cleaned or washed before entering a new work site. 5.11.3 A log shall be kept for each work site and shall be completed to document each cleaning or washing of vehicles or equipment before entering each new work site. 5.11.4 Vehicles shall be staged and stored on paved or cleared areas to the extent practicable. 5.11.5 Certified weed-free mulch, straw, hay bales, or equivalent materials shall be used where necessary.
5.12: Delineation and Avoidance of Sensitive Habitat Features. A Designated Biologist shall clearly identify sensitive resources that crews must avoid for the duration of the activities with posted signs, posting stakes, flags, and/or rope or cord, and place fencing as necessary to minimize or avoid disturbance.
5.13: Work Area Access. To the extent practicable, project-related personnel shall access a work area using existing routes, and shall not cross Covered Species' habitat outside of or en route to a work area. PG&E shall restrict project-related vehicle traffic to established roads, staging, and parking areas to the maximum extent practicable. PG&E shall ensure that vehicle speeds do not exceed 15 mph to avoid Covered Species on or traversing the roads.
5.14: Staging Areas. PG&E shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to a Work Area using, to the extent possible, previously disturbed areas. No staging areas shall be located in chaparral or scrub habitats, over rock outcroppings or within 300 feet of a stock pond or vernal pool.
5.15: Hazardous Waste. PG&E shall immediately stop and, pursuant to pertinent state and federal statutes and regulations, arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. PG&E shall properly contain and dispose of any unused or leftover hazardous products offsite.
5.16: Pesticides. At no time shall PG&E utilize broadcast baiting of rodenticides within the project area. When pesticides are used, PG&E shall follow all applicable state and federal laws, County Agricultural Commissioner regulations, label requirements, and when applicable, according to requirements in habitat management plans associated with ITP 8.5 (Habitat Acquisition and Protection)[12].

[12] PG&E may elect to provide for the acquisition, permanent protection, and perpetual management of habitat mitigation lands to complete compensatory mitigation obligations (ITP 8.5; CDFW 2022b).

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
5.17: CDFW Access. PG&E shall provide CDFW staff with reasonable access to Work Areas and mitigation lands under PG&E control and shall otherwise fully cooperate with CDFW efforts to verify compliance with or effectiveness of mitigation measures set forth in this ITP.
5.18: Refuse Removal. Upon completion of construction activities within a work area, PG&E shall remove from, and properly dispose of all temporary fill and construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.
6.1: Notifications Before Commencement of Certain Activities. Notifications shall be submitted at least 45 days in advance and prior to "release to construction" by the Designated Representative for review by CDFW. Within 14 days of request by CDFW and if not possible then at least 5 days prior to the beginning of the Covered Activity, PG&E shall provide any requested additional information and provide access for a CDFW field review of the proposed Work Area. The proposed Covered Activity may not commence until PG&E has provided the additional information to the specifications of the request by CDFW, or until field review access has been provided to CDFW. If there continues to be unresolved issues or questions, then PG&E or CDFW may request to meet and confer within 10 business of the request to resolve any outstanding issues. CDFW retains the right to determine whether a proposed Covered Activity shall not be provided coverage under this ITP.
6.4: General Compliance Monitoring. The Designated Biologist shall be onsite: ▪ Daily when Covered Species are encountered within a work area; ▪ At the determination of the Designated Biologist, when Covered Species are relocated outside a work area to monitor and assess relocation success; ▪ When required by species-specific ITP measures. A Biological Monitor shall be onsite: ▪ Daily when construction activities are conducted in [BAHCP] modeled habitat; ▪ When required by species-specific ITP measures. For construction activities in Covered Species modeled habitat that required work over a period of two weeks or greater, a General Biological Monitor shall conduct compliance inspections, at a minimum, once very week after clearing, grubbing, and grading are completed and during periods of inactivity. The General Biological Monitor shall conduct compliance inspections to: 1. Minimize incidental take of the Covered Species; 2. Prevent unlawful take of species; 3. Check for compliance with all measures of the ITP; 4. Check all exclusion zones; 5. Ensure that signs, stakes, and fencing are intact, and that construction activities are only occurring in the pre-designated project footprint. The Designated Representative or Monitoring Biologist shall prepare daily written observation and inspection records summarizing oversight activities and compliance inspections, observations of Covered Species and their sign, survey results, and monitoring activities required by this ITP.
6.8: Observations. The Designated Biologist or PG&E shall submit all observations of Covered Species to CDFW's California Natural Diversity Database within 60 calendar days of the observation and the PG&E shall include copies of the submitted forms with the next Annual Summary Report or 5-year compliance report. If observations occur on lands not owned in fee title by PG&E, then PG&E may elect to inform the landowner of an observation. If the landowner objects to submission of the observation, then PG&E may elect to not submit.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
6.10: Notification of Take or Injury. PG&E shall immediately notify the Designated Biologist if a Covered Species is taken or injured by a project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the project. The Designated Biologist or Designated Representative shall provide initial notification to CDFW by calling the Regional Office at (707) 428-2002. The initial notification to CDFW shall include information regarding the location, species, and number of animals taken or injured and the ITP Number. Following initial notification, PG&E shall send CDFW a written report within two working days. The report shall include the date and time of the finding or incident, location of the animal or carcass, and if possible, provide a photograph, explanation as to cause of take or injury, and any other pertinent information.
7.1: Equipment Fueling. No vehicles or heavy equipment shall be refueled within 100 feet of a wetland, stream, or other waterway, or within 250 feet of vernal pools, unless secondary containment is used. The fueling operator must always stay with the fueling operation. Tanks may not be topped off. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. PG&E shall maintain spill prevention and cleanup equipment in refueling areas. Sufficient spill containment and cleanup equipment shall be present at all mobile, temporary, and permanent equipment fueling locations.
7.2: Lighting. PG&E shall ensure that all artificial outdoor lighting be limited to lighting for safety and security, and designed using Illuminating Engineering Society's design guidelines, International Dark-Sky Association-approved fixtures, or other industry standards that address lighting impacts. Lighting above ground level shall be directed downward or inward, where consistent with safety concerns, and shielding shall be utilized, where needed, to minimize light scatter offsite. Light fixtures shall have non-glare finishes that shall not cause reflective daytime glare.
7.3: Construction Activities Hours. Construction activities shall cease 30 minutes before sunset and shall not begin prior to 30 minutes after sunrise, to the extent practicable. Emergency night work shall be limited in extent, duration, and brightness, to the extent feasible. For Covered Activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction, work may not occur at night during rain events in CTS habitat within 0.5 miles of known or potential breeding habitat between November 1 and April 30 unless otherwise authorized by CDFW. Covered Activities shall not occur at night for non-emergency work in California freshwater shrimp habitat any time of year unless otherwise authorized by CDFW.
7.4: Stored Materials Inspections. Workers shall thoroughly inspect for AWS and CTS in all construction pipe, culverts, or similar structures with a diameter of 7.6 centimeters (3 inches) or greater that are stored for one or more overnight periods before the structure is subsequently moved, buried, or capped. If during inspection one of these animals is discovered inside the structure, workers shall notify the Biological Monitors) and allow the Covered Species to safely escape that section of the structure before moving and utilizing the structure or moved out of harm's way by a Designated Biologist.
7.5: Cover or Ramp Open Excavations. Trenches or pits shall be covered or equipped with an escape ramp if left overnight in Covered Species modeled habitat. Crews shall inspect any trench, pit, or hole every morning prior to conducting construction activities to ensure no individuals are trapped; if any animals are found staff shall contact the Designated Biologist(s) to identify whether it is a Covered Species and if so, it shall be moved out of harm's way by the Designated Biologist(s). If the animal is not a Covered Species, then a General Monitoring Biologist or other individual with wildlife handling experience in possession of any applicable handling permits may move it out of harm's way.
7.6: Spoils Stockpiles. PG&E shall ensure that soil stockpiles are placed where soil shall not pass into wetlands or any other "waters of the state," in accordance with CFGC section 5650. PG&E shall cover and protect stockpiles to prevent soil erosion, including wind and rain. Spoils shall be placed away from chaparral habitat, rock outcroppings, and concentrated ground squirrel, pocket gopher, or other small mammal burrows or habitat features suitable for use by the Covered Species as refugia habitat.
7.7: Screen or Cap Hollow Pipes or Posts. All hollow pipes or posts that are installed as part of construction activities, or encountered in a work area that PG&E owns or is responsible for that are above ground shall be capped, screened, or filled with material by PG&E prior to the end of the day in which installation occurs.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
7.8: Equipment Inspections. Workers shall inspect for Covered Species under vehicles and equipment before the vehicles and equipment are moved. If a Covered Species is present, the worker shall notify the Biological Monitors and wait for the Covered Species to move unimpeded to a safe location. Alternatively, PG&E shall contact a Designated Biologist to determine if they can safely move the Covered Species out of harm's way in compliance with the ITP.
7.9: No Barriers to Covered Species Movements. PG&E shall construct access routes such that there are no steep curbs, v-ditches, berms, straw wattles, or dikes that could prevent Covered Species from traversing through ROWs or from exiting roadways. If curbs/ berms/straw wattles are necessary for safety and/or surface runoff, PG&E shall design and construct them to allow Covered Species to move over them. PG&E shall modify or remove exclusion fencing at the request of Biological Monitors or CDFW staff that may impede Covered Species movements.
7.17: Alameda Whipsnake Pre-Activity Habitat Features Survey. Preconstruction surveys for Alameda whipsnake and sheltering and sunning habitat features (e.g., burrows, rocky outcrops, fallen trees, etc.) shall be conducted in modeled core and perimeter core habitat for construction activities (also refer to ITP 7.19 for survey requirements in core habitat). These surveys shall be conducted by a Designated Biologist no more than 30 calendar days prior to any initial ground disturbance. These surveys shall consist of walking the work area and, if possible, any accessible adjacent areas within at least 50 feet of the work area. The Designated Biologist shall investigate potential cover sites when it is feasible and safe to do so. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, tree cavities, and debris. Sheltering, sunning, or other sensitive species features identified by the Designated Biologist shall be identified with flagging. PG&E shall avoid habitat features flagged by the Designated Biologist to the extent practicable. At the recommendation of the Designated Biologist, PG&E shall install an exclusionary barrier (ITP 7.18).
7.18: Exclusionary Barrier. PG&E shall install a temporary barrier, where feasible, to prevent the Covered Species from dispersing into the work area, including along construction access routes, prior to commencing any other construction activities. The barrier shall be installed immediately after the preconstruction surveys have been completed in accordance with ITP 7.17 and shall consist of fencing at least 42 inches tall with 36 inches above the soil surface, designed with a lip to prevent the Covered Species from climbing over the barrier, and buried to a depth of six inches below the soil surface. The soil shall be compacted against both sides of the fence to prevent the Covered Species from gaining access. The stakes shall be placed on the inside of the fence. No gaps or holes are permitted in the fencing system except for access areas as required for vehicular and pedestrian traffic. The exit/entry points shall be constructed so that it is flush to the ground and so that the Covered Species cannot access the work area. The barrier shall be designed to allow trapped individuals to leave the work area by installing one-way funnels, ramps, or other methods approved by CDFW. An alternative barrier design or directional treatment techniques in lieu of fencing may be used after receiving written authorization from CDFW. The Designated Biologist or General Monitoring Biologist shall inspect the barrier daily and the barrier shall remain in place until all construction activities have been completed or where recommended by a Designated Biologist. PG&E shall maintain and repair barrier immediately, if damaged, to ensure that it is functional and without defects. PG&E shall provide refuge opportunities along or near the outer side of the silt fence for the Covered Species (also refer to ITP 7.19).
7.19: Refugia Coverboards. Coverboards shall be installed in work areas as determined by the Designated Biologist in modeled core and perimeter core habitat prior to construction activities. When coverboards are recommended, they shall be placed to provide refuge for the Covered Species [AWS] fleeing the area, including areas where a directional treatment methodology is used (e.g., phasing a project to encourage Covered Species [AWS] to move towards core habitats and away from potentially harmful environs). When coverboards are recommended, they shall be inspected at the end of each workday by a General Monitoring Biologist and use by wildlife shall be recorded.
7.20: Alameda Whipsnake Clearance Surveys. Immediately prior to the start of construction activities impacting greater than 0.1 acre that affects core AWS habitat, including scrub or chaparral plant communities in modeled habitat, the Designated Biologist(s) shall visually survey the work area and adjacent areas, as determined by the Designated Biologist, to clear the area of AWS. If construction activities may affect habitat features flagged per ITP 7.17 then a General Biological Monitor shall conduct daily clearance surveys in the active work area(s).

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
7.21: Alameda Whipsnake Pre-Activity Tailboards. The Designated Biologist or General Biological Monitor may prescribe activity-specific tailboards trainings reminding staff of the importance of following measures to minimize impacts on AWS as they relate to the work site. Site-specific tailboards are be conducted for staff working on construction activities that impact greater than 0.1 acre in core habitat or perimeter core habitat.
7.22: Suspected Alameda Whipsnake in Work Area. If AWS is found by any person in the work area before or during construction activities, all work that could potentially injure the snake shall stop immediately and the snake shall be allowed to leave the work area on its own. If the snake does not leave the work area or cannot move to an area with sufficient habitat outside of the work area, the Designated Biologist shall move the snake to suitable habitat outside the work area. Construction activities shall resume only after the snake has been confirmed to be out of the work area.
7.23: Alameda Whipsnake Seasonal Restrictions. Disturbance in AWS modeled core and perimeter core habitat shall only take place between April 15 and October 31 to the extent feasible when AWS is more active and less likely to be affected by construction activities. For activities occurring in AWS core or perimeter core habitat between November 1 and April 14, a Designated Biologist(s) shall be present during operations.
7.24: Alameda Whipsnake Injury. If an AWS has major or serious injuries as a result of construction activities, the Designated Biologist shall immediately take it to a qualified wildlife rehabilitation or veterinary facility. PG&E shall bear any costs associated with the care or treatment of such injured AWS. If the injury is minor or healing and the AWS is likely to survive as determined by the Designated Biologist, it shall be released immediately to an area out of harm's way. PG&E shall notify CDFW of the injury to the AWS within 2 working days by telephone and e-mail followed by a written incident report to CDFW. Notification shall include the name of the facility where the animal was taken.
Applicant-Proposed Measures from the ITP FEIR
ITP FEIR APM BIO-1: Prevent or minimize the spread of invasive weeds. The following will be implemented on E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction to prevent the spread of invasive weeds during all phases of covered activities, as appropriate: ▪ During covered activities involving ground disturbance, mud and/or accumulated soils will be removed from equipment and vehicles to the extent feasible. Vehicles and equipment will be cleaned or washed before entering a new work site. A log will be kept for each job site and will be completed to document each cleaning or washing of vehicles or equipment before entering each new work site. ▪ Vehicles will be staged and stored on paved or cleared areas whenever feasible. Certified weed-free mulch, straw, hay bales, or equivalent materials will be used where necessary for covered activities.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
ITP FEIR APM BIO-2: Protect special-status wildlife encountered while performing covered activities and report covered wildlife observations. Any special-status wildlife species encountered during the course of a covered activity will be allowed to leave the area unharmed, and work activities that could disturb or harm the individual will halt until the wildlife has left the area. Encounters with a special-status species will be reported to a qualified biologist and PG&E Environmental staff. PG&E will maintain records of all covered wildlife species encountered during permitted activities. Encounters with covered wildlife species will be documented and provided to CDFW in an annual report as required by the ITP. If a covered wildlife species is encountered during the course of operations, the following information will be reported for each species: ▪ The locations (i.e., narrative, vegetation type, and maps) and dates of observations, including occurrences observed during any required surveys. ▪ The general condition of individual health (e.g., apparent injuries). ▪ If the species is moved, the location where the species was captured and the location where it was released. ▪ The locations, dates, and species and behaviors observed during covered wildlife monitoring. When conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction PG&E will document encounters with special-status species to the same level of detail as required for covered species. During PG&E's environmental screening process, PG&E will also apply this measure to other covered activities to protect special-status species and habitats based on recommendations from qualified biologists. This data will be provided in ITP annual reports.
ITP FEIR APM BIO-3: Design and site minor new construction projects activities to avoid sensitive areas. New, permanent facilities as part of minor new construction activities will be sited and designed to avoid impacts on sensitive vegetation types, sensitive natural communities, and unique plant assemblages, as well as occupied habitat and suitable habitat for special-status species, to the extent feasible. If impacts on these areas cannot be avoided, PG&E will determine if additional permitting is required to conduct the work and obtain the required permits (e.g., LSAA). If impacts are expected on covered species' habitat, Mitigation Measure BIO-1[13] (MM BIO-1) [replaced with ITP Habitat Management land Acquisition and Restoration measures] will be implemented to mitigate for habitat impacts. Where minor new construction will result in impacts on sensitive vegetation types, sensitive natural communities, or unique plant assemblages, PG&E will minimize the construction footprint and implement appropriate protective measures as recommended by the qualified biologist to protect the natural community. Examples of such measures include: reseeding with a California annual seed mix, installing protective fencing around sensitive natural communities or resources, and installing wattles, erosion blankets and other drainage controls to protect new or adjacent plantings.

[13] The ITP FEIR presented mitigation measures that were superseded by the measures included in the ITP as a condition of approval.

ITP FEIR APM BIO-3a: Minimize spread of invasive plant and plant pathogens in minor new construction.

When conducting minor new construction activities, PG&E will avoid or minimize the spread of invasive species by taking the following actions:

1. Prior to commencement of activities located on or adjacent to non-paved surfaces, a qualified biologist will flag known populations of noxious weeds and invasive plants in the work areas. Invasive plant species include those listed as invasive by the California Invasive Plant Council (Cal IPC).
2. PG&E will stage work in areas not infested with weeds or treat for weed removal prior to using an infested area.
3. Prior to ground disturbance in areas containing species susceptible to Sudden Oak Death, a qualified professional (e.g., biologist, arborist, botanist familiar with Sudden Oak Death and the vegetation communities in the area) will assess the risk of activities and will identify and implement measures to reduce or avoid the risk of Sudden Oak Death spread. These measures will include but will not be limited to the following, and will be further developed and updated based on the best available science and site-specific conditions:
   a. Designate quarantine areas and implement proper measures for disposal of infested materials (e.g., branches, split wood, wood chips),
   b. Sanitize shoes, pruning gear, and other equipment with sanitizing materials (e.g., chlorine bleach, Clorox Clean-up, Lysol, scrub brush, boot brush) before and after ground-disturbing and vegetation removal activities are implemented,
4. Clothing, footwear, and equipment used during minor new construction will be cleaned of soil, seeds, vegetation, or other debris or seed-bearing material before entering a work site or when leaving an area with infestations of invasive plants and noxious weeds.
5. Heavy equipment and other machinery used in areas with infestations of invasive plant species or Sudden Oak Death will be inspected for the presence of invasive species before use on the project site and will be cleaned before entering the site, to reduce the risk of introducing invasive plant species or plant pathogens.
6. To minimize the introduction and spread of noxious weeds and invasive plants, PG&E will avoid moving weed-infested gravel, rock, and other fill materials to relatively weed-free locations. In areas where invasive plants are removed during minor new construction or vegetation removal activities, PG&E will dispose of invasive plant biomass offsite at an appropriate waste collection facility or treat biomass onsite to eliminate seeds and propagules and prevent reestablishment; if moved offsite, PG&E will transport invasive plant material in a closed container or bag to prevent the spread of propagules during transport. PG&E will use certified weed-free straw and mulch for erosion-control projects. PG&E will maintain stockpiled, uninfested material in a weed-free condition.
7. Areas where ground disturbance has resulted in exposed soil as a result of minor new construction shall be seeded with compatible California annual species, as determined by a qualified biologist or botanist familiar with the native vegetation in the area and experienced in revegetation techniques. Revegetation will occur prior to the onset of winter rains within the year initial impacts take place. If work cannot feasibly be scheduled he rainy season, revegetation may occur as directed by the qualified biologist and no later than the onset of the next winter rains.
8. To ensure a successful revegetation effort, onsite vegetation shall meet the following success criteria:
   a. PG&E shall perform pre-activity surveys to record baseline vegetative ground cover conditions and composition by a qualified biologist prior to covered activities as follows. The biologist will record the following:
      i. Absolute percent ground cover for the entire work area.
      ii. Relative percentages of ground cover within the work area by herbaceous plants, shrubs, trees, and noxious/invasive plants.
      iii. Develop a catalog of all invasive species present within the work area, including an estimate of percent composition by species.
   b. PG&E will conduct post-activity monitoring of work areas in the spring following completion of minor new construction.
      i. A qualified biologist will record any new invasive species that may have inadvertently been introduced to the work area. The biologist shall make special note of any new invasive plant species rated as "high" by the Cal IPC.
      ii. A qualified biologist will record whether there was an increase in relative cover of invasive species from baseline that may have resulted from the covered activity.
      iii. If relative cover of invasive plant species has increased within the work area, PG&E shall remove and/or dispose of invasive plants in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor. If any new invasive plants rated by Cal IPC as "high" are found within the work area, they will be removed in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor.

If the relative ground cover of invasive plants exceeds baseline by 100 percent or more, PG&E will reseed the areas where invasive plants are removed and monitor for one additional year.

ITP FEIR APM BIO-4: Avoid special-status plants.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
Occurrences of special-status plant species will be avoided to the extent practicable and will include performance of project activities in special-status plant habitat after senescence. PG&E has created "Map Book zones" for the 13 state or federally listed plants that are covered in the O&M HCP. A Map Book zone is defined as an area of occupied or potentially occupied the HCP- covered plant species habitat as determined by PG&E botanical surveys. When rare and endangered plant species subject to the Native Plant Protection Act cannot be avoided, PG&E will follow the requirements of California Fish and Game Code Sections 1913(b) and 1913(c) concerning notification to CDFW at least 10 days in advance and provide an opportunity to salvage such species. If a special-status plant is found or known to occur, the plant will be avoided if feasible (i.e., O&M objectives could still be met). If feasible to avoid, avoidance will include establishing a buffer around the plants and demarcation of the buffer by a qualified biologist or botanist using flagging. Consideration of site-specific environmental factors such as terrain, site hydrology, light, and potential introduction of invasive plants may inform the avoidance approach.
ITP FEIR APM BIO-5: Erect wildlife flagging or exclusion fencing. Prior to construction or commencement of any activity that, in the absence of fencing, is likely to directly or indirectly adversely affect covered species, flagging or exclusion fencing for the species will be installed around the perimeter of the activity footprint[14], or otherwise to ensure species protection. Any exemption or modification of flagging or exclusion fencing requirements will be based on the specifics of the activity, site-specific population, or habitat parameters. Sites with low population density and disturbed, fragmented, or poor habitat will likely be candidates for flagging or fencing requirement exemptions or modifications. Substitute measures, such as onsite Biological Monitors in the place of the flagging or fencing requirement, will be performed as appropriate. Prior to flagging or fencing, the qualified individual will ensure (to the extent feasible) that covered special-status species are absent from the activity footprint. After an area is flagged or fenced, PG&E is responsible for ensuring that covered special-status species flagging or fencing is maintained and opened/closed appropriately during project activities and regularly inspected for damage, which will be repaired as soon as possible. This measure will also be applied when conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction when these activities are likely to adversely affect special-status species. PG&E may also apply this measure to other covered activities to protect special-status species and habitats based on recommendations from qualified biologists.
ITP FEIR APM BIO-6: Protect nesting birds. All vegetation clearing and ground-disturbing activities will be conducted outside of the nesting season (generally March 1–August 31) to the extent feasible. If this is not feasible, a biologist or qualified individual will determine if preconstruction activity surveys, nest buffers, and/or monitoring are needed in accordance with PG&E's Nesting Bird Management Plan. Nesting bird surveys will be scheduled to occur within a timeframe prior to construction the activity that is suitable for the detection of recently established nests. If active nests containing eggs or young are found, the qualified biologist or individual will establish an appropriate nest buffer in accordance with the species-specific buffers in PG&E's Nesting Bird Management Plan. Nest buffers under the Plan will be species-specific and can range from 15 to 100 feet for passerines, 50 to 300 feet for raptors, or larger if necessary, depending on the planned activity's level of disturbance, site conditions, and the observed bird behavior. Covered activities will not commence within the established buffer areas until the qualified biologist or individual determines that the young have fledged or the nest is no longer active. Active nests will be periodically monitored until the young have fledged or the activity all construction is finished. If birds with active nests are observed showing behavioral signs of agitation (e.g., standing up from a brooding position, flying off the nest) during covered activities, the buffer will be increased to a distance in which the behavioral signs of agitation cease, in accordance with PG&E's Nesting Bird Management Plan.

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

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
ITP FEIR APM BIO-7: Avoid and protect special-status bats. When feasible, activities directly affecting bat roosting habitat will be conducted outside of the bat breeding/pupping season (generally, April through mid-September). If work that will affect known bat breeding sites must be done in the bat breeding/pupping season, a qualified biologist will evaluate known breading/roosting sites or conduct surveys for bat roosts in suitable breeding/roosting sites (e.g., bridges, mines, caves, trees with hollows, palm trees, snags, buildings, long and dark culverts, rock outcrops, dense tree canopies, and flaking tree bark). If evidence of a bat maternity roost is found or maternity roosts are detected, PG&E will avoid conducting covered activities that may directly affect the active roost site, including the following: ▪ If a maternity roost is identified then the qualified bat biologist will develop a Bat Avoidance and Monitoring Plan prior to the start of project activities that shall include: (1) an assessment of all impacts to bats from the activity, including noise disturbance during covered activities and (2) effective AMMs to protect bats in order to ensure that direct impact to active bat maternity roost site do not occur. Notification will be provided to CDFW prior to the start of covered activities. The notification will include a copy of the Bat Avoidance and Monitoring Plan. If direct impacts to identified maternity roost sites cannot be avoided, PG&E will provide a compensatory mitigation plan to CDFW for review and approval. ▪ As necessary, an exclusionary buffer will be maintained around active roosts. The size of the buffer will be determined by the qualified biologist based on factors such as the planned activity's level of disturbance and site conditions and will typically be 250 feet. ▪ As necessary, a qualified biologist will monitor active bat roost site buffers during O&M activities to determine if roosting activity is influenced by noise or vibrations until a qualified biologist has determined if the young bats are volant (about to fly) or the roost is unoccupied. When feasible, to protect bats and in accordance with BAHCP BMP-30[15] tree work near riparian zones will be conducted during the dry season. If it is not feasible to conduct tree work during the dry season, operations will occur between rain events or during dry spells unless there is an emergency or imminent threat to life or property.
Project-specific Applicant-Proposed Measures for Species Not Covered for Take In the BAHCP/ITP
MOX APM BIO-1: Preconstruction Surveys and Biological Monitoring. To reduce impacts to sensitive biological resources that may be present within and adjacent to work areas, clearance surveys and preconstruction surveys will be implemented at the discretion of the PG&E biologist.
MOX APM BIO-2: Crotch's Bumble Bee and Monarch Butterfly. The CDFW ITP FEIR concluded that implementation of the HCP and ITP measures (such as FP-01 through FP-04, FP-07, FP-10, FP-11, FP-12, and FP-14) will reduce the level of impact to less than significant for the Crotch's bumble bee; in this APM, these same measures are being extended to include the Monarch butterfly, which was not addressed in the HCP or ITP.
MOX APM BIO-3: Foothill Yellow-legged Frog. Applicable measures from PG&E's BAHCP, including FP-01 through FP-08, FP-10 through FP-17, and AMM Wetland-2 (Tables 5.4-9 and 5.4-10) also will minimize impacts to FYLF. All special-status amphibians encountered in the work areas will be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area in accordance with ITP FEIR APM BIO-2 (Table 5.4-12).
MOX APM BIO-4: Northwestern Pond Turtle. The measures FP-01 through FP-17 from PG&E's BAHCP and AMM Wetland-2 to minimize potential impacts to CRLF and wetlands also will minimize impacts to Northwestern pond turtle (Tables 5.4-9 and 5.4-10).

[15] BMP-30 from the BA HCP: When possible, activities near streams, wetlands, or on saturated soils shall be conducted during the dry season (generally May 15–October 15) or during periods of minimum flow. If it is not possible to perform the work in the dry season, perform rainy season work during dry spells between rain events. For the purposes of this project, a riparian zone will have a buffer distance of 250 feet.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
MOX APM BIO-5: Nesting Birds. PG&E will implement FP-01 through FP-18 from PG&E's Bay Area O&M HCP as well as ITP FEIR APM BIO-6 to avoid and minimize impacts to nesting birds (Tables 5.4-9 and 5.4-12). As both helicopter and drone use are proposed for this project, the established nest buffers will include vertical buffers based on the horizontal ground buffers presented in PG&E's Nesting Birds: Species-Specific Buffers for PG&E Activities (Appendix B6).
MOX APM BIO-6: San Francisco Dusky-footed Woodrat. Measures FP-01 through FP-17 from the BAHCP (Table 5.4-9) also will reduce impacts to dusky-footed woodrat. Any woodrat nests encountered in the work areas during covered activities will be reported to the project biologist or PG&E Environmental staff and individuals, if found, will be allowed to leave the work area (ITP FEIR APM BIO-2) (Table 5.4-12). If active nests are identified and cannot be avoided, PG&E will implement the dismantling and relocation measures described in Attachment D of Appendix B3.
Section 5.5 Cultural Resources (CUL)
APM CUL-1: Develop and Implement Worker Environmental Awareness Program Prior to Construction. PG&E will design and implement a worker environmental awareness program that will be provided to all project personnel involved in earth-moving activities. This training will be administered by a qualified cultural resource professional either as a standalone training or as part of the overall environmental awareness training required by the project and may be recorded for use in subsequent training sessions. No construction worker will be involved in field operations without having participated in the worker environmental awareness program, which will include, at a minimum: ▪ A review of archaeology, history, precontact, and Native American cultures associated with historical resources near the project ▪ A review of applicable local, state, and federal ordinances, laws, and regulations pertaining to historic preservation ▪ A discussion of procedures to be followed in the event that unanticipated cultural resources are discovered during implementation of the project ▪ A discussion of disciplinary and other actions that could be taken against persons violating historic preservation laws and PG&E policies ▪ A statement by the construction company or applicable employer agreeing to abide by the Worker Education Program, PG&E policies, and other applicable laws and regulations
APM CUL-2: Inadvertent Cultural Resource Discoveries. If unanticipated cultural resources are identified during construction, the following procedures will be initiated: ▪ All ground-disturbing construction activities within 100 feet of the discovery will halt immediately. ▪ The construction crew will protect the discovery from further disturbance until a qualified archaeologist has assessed it. ▪ The construction supervisor will immediately contact the project environmental inspector and the PG&E cultural resource specialist. ▪ The PG&E cultural resources specialist will coordinate with the state lead officials, as appropriate. If the discovery can be avoided or protected and no further impacts will occur, then the resource will be documented on DPR 523 forms, and no further effort will be required. If the resource cannot be avoided and may be subjected to further impacts, qualified personnel will evaluate the significance of the discovery in accordance with the state laws outlined previously; personnel will implement data recovery or other appropriate treatment measures, if warranted. A qualified historical archaeologist will complete an evaluation of historic period resources, while evaluation of precontact resources will be completed by a qualified archaeologist specializing in California prehistoric archaeology. Evaluations may include archival research, oral interviews, and/or field excavations to determine the full depth, extent, nature, and integrity of the deposit.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
APM CUL-3: Unanticipated Discovery of Human Remains. If human remains or suspected human remains are discovered during PG&E construction, work within 100 feet of the find will stop immediately and the construction supervisor will contact the PG&E cultural resources specialist, who meets the Secretary of Interior's Standards for archaeology. Upon discovery, the Coroner Division of the Alameda County Sheriff's Office will be contacted for identification of human remains. The Coroner has 2 working days to examine the remains after being notified. If the remains are Native American, the Coroner must notify the Native American Heritage Commission (NAHC) of the discovery within 24 hours. The NAHC then will identify and contact a Most Likely Descendant (MLD). The MLD may make recommendations to the landowner or representative for the treatment or disposition, with proper dignity, of the remains and grave goods. When proper consultation has occurred, a procedure that may include the preservation, excavation, analysis, and curation of artifacts and/or reburial of those remains and associated artifacts will be formulated and implemented. If the remains are not Native American, the Coroner will consult with the archaeological research team and the lead agency to develop a procedure for the proper study, documentation, and ultimate disposition of the remains. If a determination can be made as to the likely identity – either as an individual or as a member of a group – of the remains, an attempt should be made to identify and contact any living descendants or representatives of the descendant community. As interested parties, these descendants may make recommendations to the owner or representative for the treatment or disposition, with proper dignity, of the remains and grave goods. Final disposition of any human remains or associated funerary objects will be determined in consultation between the landowner and the MLD.
Section 5.6 Energy
The project will have less-than-significant impacts on energy. Implementation of the Applicant-Proposed Measure (APM) GHG-1 will further minimize potential impacts. APM GHG-1 (refer to Section 5.8) will simultaneously reduce greenhouse gas emissions and contribute to the reduction of energy resources.
Section 5.7 Geology, Soils, and Paleontological Resources (GEO, PAL)
APM GEO-1: Development of Seismic Design Criteria and Appropriate Seismic Safety Design Measures Implementation. The project will be designed based on current seismic design practices and guidelines. As part of design, site-specific seismic analyses will be performed to evaluate peak ground accelerations for design of project components. Because the proposed power cables will be lifeline utilities, the 84th percentile motions (one standard deviation above the median) will be used. Additionally, the Institute of Electrical and Electronics Engineers (IEEE) Standard 693, Recommended Practices for Seismic Design of Substations, has specific requirements to mitigate past substation equipment damage. These design guidelines will be implemented during equipment replacement at substations. Substation equipment will be purchased using the seismic qualification requirements in IEEE 693.
APM GEO-2: Site-Specific Landslide Assessment. As described in Section 5.7.1.4, two proposed structure locations are near active or prehistoric/older slides, with the structures typically located uphill from mapped landslides. A site-specific design-level evaluation of these locations will be performed to evaluate the potential for these landslides to impact project facilities. Appropriate design measures for the protection of the power line structure stability, which may include foundation design enhancements or adjustments to structure locations, will be incorporated into the design.
APM GEO-3: Appropriate Design Measures Implementation. Potentially problematic subsurface conditions during project construction include soft or loose soils that could be susceptible to liquefaction, especially at and in the vicinity of stream or river crossings. Where soft or loose soils are encountered during design studies or construction, appropriate measures will be implemented to avoid, accommodate, replace, or improve soft or loose soils. Such measures may include the following: ▪ Overexcavating soft or loose soils and replacing them with nonexpansive engineered fill. ▪ Increasing the density and strength of soft or loose soils through mechanical vibration and compaction. ▪ Treating soft or loose soils in place with binding or cementing agents.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
APM PAL-1: Retain a Qualified Paleontological Principal Investigator. A Paleontological Principal Investigator who meets the standards set forth by the Society of Vertebrate Paleontology will be retained to ensure that all APMs related to paleontological resources are properly implemented during construction. The Paleontological Principal Investigator will have a master's degree or Ph.D. in geology or paleontology, have knowledge of the local paleontology, and be familiar with paleontological procedures and techniques.
APM PAL-2: Worker Environmental Awareness Training. Training on paleontological resources protection will be administered for excavation deeper than 3 feet below ground surface (bgs) at all work locations. Training may be provided by PG&E as a stand-alone training, or it may be included as part of the overall environmental awareness training as required by the project. The training will include the following: ▪ The types of fossils that could occur at the project site ▪ The types of lithologies in which the fossils could be preserved ▪ The procedures that should be taken in the event of a fossil discovery ▪ Penalties for disturbing paleontological resources
APM PAL-3: Paleontological Resource Monitoring for Select Construction Activities. A paleontological monitor will be present to monitor for paleontological resources in areas where Siesta Formation (Tst), Orinda Formation (Tor), glauconitic sandstone (Ta), and Pleistocene alluvial and fluvial deposits (Qpaf) occur at the surface and where excavation is greater than 3 feet deep and, for excavations involving drilling or augering, where a drill diameter that is larger than 3 feet will be used. Monitoring is not required if this work occurs in soil or sediment that is imported or previously disturbed. Locations of activities requiring monitoring where previously disturbed or imported soil or sediment is not known are: ▪ Structure foundation excavation greater than 3 feet bgs using a drill that is 3 feet or greater in diameter at the following locations: RN1, RS1, RS2, RN7, RS7, RN8, RS8, RN21, RS21, TN28, TN29 and TS28. ▪ Vault installation within Park Boulevard beginning at its intersection with Wellington Street continuing within Park Boulevard Way to the Oakland X Substation property. The paleontological monitor will be able to: (1) recognize fossils and paleontological deposits and deposits that may be paleontologically sensitive; (2) take accurate and detailed field notes, photographs, and locality coordinates; and (3) document project-related ground-disturbing activities, their locations, and other relevant information, including a photographic record. Monitoring at these locations can be reduced if, after initial monitoring, it is determined the project's Paleontological Principal Investigator that there is a low likelihood of identifying paleontological resources.
APM PAL-4: Unanticipated Paleontological Discovery. If significant paleontological resources are discovered during PG&E's construction activities, the following procedures will be followed: ▪ Stop work immediately within 100 feet of the fossil find. ▪ Contact the designated project inspector and PG&E Cultural Resource Specialist (CRS) immediately. ▪ Protect the site from further impacts, including looting, erosion, or other human or natural damage. ▪ Arrange for a qualified paleontologist to evaluate the discovery. If the discovery is determined to be significant, PG&E will implement measures to protect and document the paleontological resource. Work may not resume within 100 feet of the find until approved by the paleontologist and CRS. ▪ Obtain permission from the landowner before treating the fossils. Curate all fossils discovered in an appropriate repository. ▪ A qualified paleontologist will be notified to review the need for paleontological monitoring during subsequent ground-disturbing activities with the potential to affect paleontologically sensitive sediments at that location. The qualified paleontologist will be responsible for the reassessment of paleontological sensitivity upon the receipt of additional information from ongoing excavations, which may result in reducing or increasing the amount of monitoring required.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
Section 5.8 Greenhouse Gas Emissions (GHG)
APM GHG-1: PG&E Minimize Gas Emissions. PG&E will implement the following to minimize GHG emissions consistent with the recommendations provided in the CPUC's Draft Environmental Measure: ▪ If suitable park-and-ride facilities are available in the project vicinity, construction workers shall be encouraged to carpool to the job site. ▪ The Applicant shall develop a carpool program to the job site. ▪ On-road and off-road vehicle tire pressures shall be maintained to manufacturer specifications. Tires shall be checked and re-inflated at regular intervals. ▪ Demolition debris shall be recycled for reuse to the extent feasible. ▪ The contractor shall use line power instead of diesel generators at all construction sites where line power is available. ▪ The contractor shall maintain construction equipment per manufacturing specifications. ▪ Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time will depend on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction supervisors will include briefings to crews on vehicle use as part of preconstruction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use.
APM GHG-2: PG&E Minimize SF6 Emissions. PG&E will implement the following to minimize SF6 emissions: ▪ Incorporate Moraga Substation modifications into PG&E's systemwide SF6 emission reduction program. Since 1998, PG&E has implemented a programmatic plan to inventory, track, and recycle SF6 inputs, and inventory and monitor systemwide SF6 leakage rates to facilitate timely replacement of leaking breakers. PG&E has improved its leak detection procedures and increased awareness of SF6 issues within the company. X-ray technology is now used to inspect internal circuit breaker components to eliminate dismantling of breakers, reducing SF6 handling and accidental releases. As an active member of EPA's SF6 Emission Reduction Partnership for Electrical Power Systems, PG&E has focused on reducing SF6 emissions from its transmission and distribution operations and has reduced the SF6 leak rate by 89 percent and absolute SF6 emissions by 83 percent. ▪ Require that new breakers at Moraga Substation, as applicable, have a manufacturer's guaranteed maximum leakage rate of 0.5 percent per year or less for SF6. ▪ Maintain substation breakers in accordance with PG&E's maintenance standards. ▪ Comply with CARB Early Action Measures as the policies become effective.
Section 5.9 Hazards, Hazardous Materials, and Public Safety (HAZ)
APM HAZ-1: Development and Implementation of Hazardous Material and Emergency Response Procedures. PG&E will implement construction controls, training, and communication to minimize the potential exposure of the public and site workers to potential hazardous materials during all phases of project construction. Construction procedures that will be implemented include worker training appropriate to the worker's role, and containment and spill control practices in accordance with the Stormwater Pollution Prevention Plan (SWPPP) (APM HYD-1).

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
APM HAZ-2: Emergency Spill Supplies and Equipment. Materials will be available on the project site during construction to contain, collect, and dispose of any minor spill. Oil-absorbent material, tarps, and storage drums will be available on the project site during construction and will be used to contain and control any minor releases of oil. If excess water and liquid concrete escape during pouring, they will be directed to adjacent lined and bermed areas, where the concrete will dry and then be transported for disposal per applicable regulations.
APM HAZ-3: Shock Hazard Safety Measures. All authorized personnel working on site, during either construction or O&M, will be trained according to PG&E standards. Training will be implemented prior to construction by PG&E or construction contractor safety managers. A record of when the safety training occurred, the safety manager delivering the training and who attended will be stored by the contractor and available for review by PG&E and the CPUC as requested. Training will include identifying electrical hazards, establishing safe distances from the lines, deenergizing lines where appropriate, and use of personal protective equipment such as arc flash-resistant apparel. The public will be excluded from work areas. When power lines are energized during construction and operation, they are suspended in the air at the requisite ground clearance distance that avoids shock or arc flash hazard to the public.
APM HAZ-4: Worker Environmental Awareness Training Program. A worker environmental awareness training program (WEAP) will be developed and implemented prior to construction. The WEAP program will be established to communicate environmental concerns and appropriate work practices to all construction field personnel. The training program will emphasize site specific physical conditions to improve hazard prevention and will include a review of the SWPPP, which also will address spill response and proper best management practice (BMP) implementation. The WEAP program will be provided separately to CPUC staff prior to construction. If it is necessary to store chemicals, they will be managed in accordance with all applicable regulations. Safety data sheets will be maintained and kept available onsite, as applicable.
APM HAZ-5: Potentially Contaminated Soil or Groundwater. Where there is known potential of contaminated soil in the area based on review of databases of hazardous materials and sites, soil sampling will be conducted in project areas prior to or upon commencement of construction. Soil that is known (based on testing prior to or upon commencement of construction) or suspected of being contaminated (based on visual, olfactory, or other evidence identified during construction) and is removed during trenching or excavation activities will be segregated. These segregated soils will require testing and investigation procedures to be supervised by a qualified person, as appropriate, to meet state and federal regulations before disposal at a non-PG&E facility that is licensed to handle the soil based on contaminants identified from test results. If the soil is taken to a PG&E spoils facilities, the soil will be tested, handled, and disposed of in accordance with applicable state and federal regulations. Appropriate handling, transportation, and disposal locations will be determined based on results of the analyses. If the soil is contaminated above hazardous levels, it will be contained and disposed of offsite at a licensed waste facility. In addition, results will be provided to contractor and construction crews to inform them about soil conditions and potential hazards. The location, distribution, and frequency of the sampling locations where there is a known potential of contaminated soil in the area will be determined during final design with the intent to provide adequate representation of the conditions in the construction area. Groundwater is not expected to be encountered during construction. However, if it is encountered, groundwater will be collected during construction, contained, tested, and disposed of in accordance with all applicable regulations. Containment will be done by pumping the groundwater into holding tanks. Noncontaminated groundwater will be released to the stormwater drainage system in the area (with prior approval). If the groundwater is contaminated, it will be disposed of at a facility that accepts liquid hazardous waste, in accordance with applicable regulations.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
Section 5.10 Hydrology and Water Quality (HYD)
APM HYD-1. Prepare and Implement an SWPPP. Stormwater discharges associated with project construction activities are regulated under the CGP. Cases in which construction will disturb more than 1 acre of soil require submittal of a Notice of Intent, development of an SWPPP (both certified by the Legally Responsible Person), periodic monitoring and inspections, retention of monitoring records, reporting of incidences of noncompliance, and submittal of annual compliance reports. Pacific Gas and Electric Company (PG&E) will comply with all CGP requirements for construction of project components. Following project approval, PG&E will prepare and implement a SWPPP, which will address erosion and sediment control concerns to minimize construction impacts on surface water quality, as well as reduce the potential for stormwater runoff to impact adjacent properties. The SWPPP will be designed specifically for the hydrologic setting of the proposed project (surface topography, storm drain configuration, and other factors). Implementation of the SWPPP will help stabilize graded areas and reduce erosion and sedimentation. The SWPPP will propose BMPs that will be implemented during construction activities. Erosion and sediment control BMPs – such as straw wattles, erosion control blankets, and silt fences – will be installed in compliance with the SWPPP. Suitable soil stabilization BMPs will be used to protect exposed areas during construction activities, as specified in the SWPPP. During construction activities, BMPs will be implemented to reduce exposure of construction materials and wastes to stormwater. BMPs will be installed following manufacturer's specifications and according to standard industry practice. Erosion and sediment control measures may include the following: ▪ Straw wattle, silt fence, or gravel bag berms ▪ Trackout control at all entrances and exits ▪ Stockpile management ▪ Effective dust control measures ▪ Good housekeeping measures ▪ Stabilization measures, which may include wood mulch, gravel, and seeding Identified erosion and sediment control measures will be installed prior to the start of construction activities and will be inspected and improved as required by the CGP. Temporary sediment control measures intended to minimize sediment transport from temporarily disturbed areas such as silt fences or wattles will remain in place until disturbed areas are stabilized. In areas where soil is to be temporarily stockpiled, soil will be placed in a controlled area and will be managed using industry-standard stockpile management techniques. Where construction activities occur near a surface waterbody or drainage channel, the staging of construction materials and equipment and excavation spoil stockpiles will be placed and managed in a manner to minimize the risk of sediment transport to the drainage. Any surplus soil will be transported from the site and disposed of in accordance with federal, state, and local regulations. The SWPPP will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials will be permitted, if necessary. A copy of the SWPPP will be provided to CPUC for recordkeeping. The plan will be maintained and updated during construction as required by the CGP.
APM HYD-2. Worker Environmental Awareness Program. The worker environmental awareness program will be developed and provided separately to CPUC staff prior to construction. The worker environmental awareness program will communicate environmental issues and appropriate work practices specific to project components to all field personnel. These will include spill prevention and response measures and proper BMP implementation. A copy of the worker environmental awareness program record will be provided to CPUC for recordkeeping at the completion of the project. An environmental monitoring program also will be implemented to ensure that the plans are followed throughout the construction period for project components.
APM HYD-3. Project Site Restoration. As part of the final construction activities, PG&E will restore all removed curbs and gutters, repave, and restore landscaping or vegetation, as necessary.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
Section 5.11 Land Use and Planning
The project will have no impact on land use and planning and no land use APMs are included. However, several APMs discussed in other sections will reduce any nuisances to nearby properties and people. These include APM AIR-1, which includes measures to control dust during construction; APM NOI-1, which details how PG&E will provide written notice at least 1 week prior to planned construction activities to all sensitive receptors and residences within approximately 500 feet of construction sites, as well as providing contact information for a project public liaison to receive and respond to concerns; and APM TRA-1, which will provide temporary traffic controls to prevent excessive congestion or traffic hazards during construction.
Section 5.12 Mineral Resources
The project will have no impact on mineral resources, so no Applicant-proposed measures are included.
Section 5.13 Noise (NOI)
APM NOI-1: General Construction Noise Management. PG&E will employ standard noise-reducing construction practices such as the following: ▪ Comply with manufacturer's muffler requirements on all construction equipment engines and ensure exhaust mufflers are in good condition. ▪ Turn off construction equipment when not in use, where applicable. ▪ Locate stationary equipment, construction staging areas, helicopter landing zones, and construction material areas as far as practical from sensitive receptors. ▪ Include noise control requirements for construction equipment and tools in specifications provided to construction contractors to the maximum extent practicable, including performing all work in a manner that minimizes noise. PG&E will provide written notice at least 1 week prior to planned construction activities to all sensitive receptors and residences within approximately 500 feet of construction sites, staging yards, access roads, and areas of drone use, and within approximately 1,000 feet of helicopter landing zones. PG&E also will post notices in public areas, including recreational use areas, within approximately 500 feet of the project alignment and construction work areas. The announcement will state approximately where and when construction will occur in the area, including areas of helicopter construction. Notices will provide tips on reducing noise intrusion – for example, by closing windows facing the planned construction. PG&E will identify a public liaison to respond to concerns of neighboring receptors during construction, including residents, about construction noise disturbance. PG&E also will establish a toll-free telephone number for receiving questions or concerns during construction and develop procedures for responding to callers. Contact information for reaching the PG&E public liaison officer by telephone or in person will be included in the notices and also posted conspicuously at the construction sites. PG&E will respond to questions or concerns received.
APM NOI-2: Noise Minimization with Portable Barriers. Compressors and other small stationary equipment used during construction of PG&E project components will be shielded with portable barriers if appropriate and if located within approximately 200 feet of a residence.
APM NOI-3: Noise Minimization with Quiet Equipment. Quiet equipment will be used during construction of PG&E project components whenever possible (for example, equipment that incorporates noise control elements into the design, such as quiet model compressors or generators, can be specified).
APM NOI-4: Noise Minimization through Direction of Exhaust. When in proximity to noise-sensitive uses, equipment exhaust stacks and vents will be directed away from those noise-sensitive uses where feasible.
APM NOI-5: Nighttime Noise Disruption Minimization through Residential Notification. In the event that nighttime construction is necessary for PG&E project components – for instance, if certain activities such as underground line splicing need to continue to completion – affected residents will be notified in advance by mail, personal visit, or door-hanger, and will be informed of the expected work schedule.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
APM NOI-6: Helicopter Noise Minimization Measures. PG&E will select helicopter landing zones that are located at least 500 feet from occupied residences where feasible. Nearby residences will be notified at least 1 week ahead of helicopter operations to minimize concerns regarding helicopter noise.
APM NOI-7: Noise Minimization Equipment Specification. PG&E will specify general construction noise reduction measures that require the contractor to ensure that all equipment is in good working order, adequately muffled, and maintained in accordance with the manufacturers' recommendations.
APM NOI-8: Incorporate Vibration Assessment into Project Construction. Where pile driving may be required adjacent to residential or commercial uses, final design efforts and construction methods will consider soils and hammer type and use when assessing potential for vibration. Vibration monitoring will be conducted during pile driving activities, or in response to a complaint, to confirm that vibration levels are within acceptable guidelines. Site-specific minimization measures such as modifying the type of hammer, reducing hammer energy, modifying hammer frequency, or using vibratory pile driving will be implemented as necessary to reduce the potential effects of off-site vibration. Monitoring may be reduced or eliminated when it has been established that these measures, if required, are effective for the site conditions.
Section 5.14 Population and Housing
The project will have no impact on population and housing, so no Applicant-proposed measures are included.
Section 5.15 Public Services
The project will have no impact on public services, so no Applicant-proposed measures are included.
Section 5.16 Recreation (REC)
APM REC-1: Coordination with Park and Open Space Management and Signage. PG&E will coordinate closely with park and open space landowners for temporary public land closures during project construction activities. If traditional access is temporarily unavailable, signs advising recreational facility users of construction activities, including directions to alternative trails and/or bikeways, will be posted at entrance gates to park and open space areas. Signage will be posted at least 1 week in advance of the construction activity near a park or open space area.
Section 5.17 Transportation (TRA)
APM TRA-1: PG&E Temporary Traffic Controls. PG&E will obtain any necessary transportation and encroachment permits from Caltrans and the local jurisdictions, as required, including those related to state route crossings and the transport of oversized loads and certain materials, and will comply with permit requirements designed to prevent excessive congestion or traffic hazards during construction. PG&E will develop traffic control plans to detail road and lane closure or width reduction or traffic diversion as required by the encroachment permits. Residents and emergency service providers will be notified of upcoming road closures consistent with the notification procedures described in APM NOI-1. Construction activities that are in, along, or cross local roadways will follow best management practices and local jurisdictional encroachment permit requirements—such as traffic controls in the form of signs, cones, and flaggers—to minimize impacts on traffic and transportation, including emergency vehicle access and evacuation routes in the project area. Where work areas will occupy the end of a street with no secondary access and residential access may be restricted, PG&E will implement residential safe transport. PG&E will provide the CPUC with copies of permits obtained prior to construction activity in each jurisdiction or location. If required for obtaining a local encroachment permit, PG&E will establish a Traffic Management Plan (TMP) to address haul routes, timing of heavy equipment and building material deliveries, workers and equipment parking, potential street or lane closures, signing, lighting, and traffic control device placement. When working on state highways, PG&E will ensure traffic control operations are compliant with both the California Temporary Traffic Control Handbook, 2019 edition, and the California Manual on Uniform Traffic Control Devices, 2014 edition, and any updated versions of these documents that become available before start of construction.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
APM TRA-2: PG&E Repair of Damaged Transportation Infrastructure. Restoration of roads and all removed or damaged curbs, gutters, and sidewalks will be done in compliance with the locally issued ministerial permits. Road restoration is based on matching the roadway's existing subbase and surface (asphalt, concrete, or a combination of both). After backfilling a duct bank trench or vault excavation, a road base backfill or slurry concrete cap will be installed and a pavement surface will be laid where the trench or excavation occurred. The edges of the pavement surface will be leveled to match the existing adjacent pavement surface. If the initial pavement surface is cold patch asphalt, then it will act as a temporary layer to return the road to service per ministerial permit conditions. Temporary cold patch asphalt will be removed before the final road pavement surface is installed. Final pavement surface restoration will use hot mix asphalt, concrete, or a combination of both depending on the ministerial permit conditions. Repaving and striping will be completed sequentially as completed sections of road surface are being restored, and this process will continue until the pavement restoration activity is complete.
Section 5.18 Tribal Cultural Resources (TCR)
APM TCR-1: Undiscovered Potential Tribal Cultural Resources. After stopping work and following the procedure for determining eligibility in APM CUL-2, in the event that a prehistoric or protohistoric site is identified and cannot be avoided, PG&E will contact the CPUC to identify an appropriate tribe with whom to consult on treatment. If no agreement can be reached for mitigation after discussions with the California Native American tribe(s) or it is determined that the tribe(s)' preferred mitigation is not feasible, PG&E will implement one of the example mitigation measures listed in Public Resources Code Section 21084.3(b), or other feasible mitigation.
Section 5.19 Utilities and Service Systems
The project will have a less-than-significant impact on utilities and service systems, so no Applicant-proposed measures are included.
Section 5.20 Wildfire (WFR)

APM WFR-1: Construction Fire Prevention Plan.
A project-specific Construction Fire Prevention Plan for construction of the project will be prepared prior to initiation of construction by PG&E. The PG&E plan will be approved by the CPUC. The final plan will be approved by the CPUC at least 30 days prior to the initiation of construction activities. The plan will be fully implemented throughout the construction period, and it will include the following at a minimum:
▪ The purpose and applicability of the plan
▪ Incorporation of the requirements in PG&E's current Utility Standard TD-1464S for Preventing and Mitigating Fires While Performing PG&E Work
▪ Responsibilities and duties for compliance
▪ Preparedness training and drills
▪ Procedures for fire reporting, response, and prevention that include:
  - Identification of daily site-specific risk conditions
  - The tools and equipment needed on vehicles and on hand at sites
  - Reiteration of fire prevention and safety considerations during tailboard meetings
  - Daily monitoring of the Red-Flag Warning System with appropriate restrictions on types and levels of permissible activity
▪ Coordination procedures with federal, state, and local fire officials and emergency responders, including notifications of temporary lane or road closures
▪ Crew training, including the construction fire prevention practices described in APM WFR-2
▪ Method(s) for verifying that all plan protocols and requirements are being followed
PG&E or its contractor will be responsible for training project personnel and enforcing all provisions of the PG&E Construction Fire Prevention Plan, as well as performing other duties related to fire detection, prevention, and suppression for the project. Construction activities will be monitored to ensure implementation and effectiveness of the plan.

Table 3.11-1. Applicant-Proposed Measures

Applicant-Proposed Measures
APM WFR-2: Fire Prevention Practices. PG&E will implement the following fire prevention practices at active construction sites and during maintenance activities: ▪ Existing PG&E personnel conducting maintenance on the project are trained on the PG&E Utility Standard TD-1464S for Preventing and Mitigating Fires While Performing PG&E Work or relevant current standard and will follow the standard in regard to training, preparation, communication methods and means, observations of and alerts concerning weather conditions including NWS events, and PG&E's work restrictions and fire mitigation required for elevated PG&E Utility FPI ratings (R4, R5, or R5-Plus). ▪ Construction personnel will be trained in fire-safe actions, including PG&E's current Utility Standard for Preventing and Mitigating Fires While Performing PG&E Work, Wildfire Prevention Contract Requirements, and the project's PG&E Construction Fire Prevention Plan concerning initial attack, firefighting, and fire reporting. Construction personnel will be trained and equipped to extinguish small fires to prevent them from growing into more serious threats. ▪ Construction personnel will have fire suppression equipment on all construction vehicles per PG&E Utility Standard TD-1464S and will be required to park vehicles away from dry vegetation. Water tanks and/or water trucks will be sited or available at active project sites for fire protection during construction. ▪ All construction crews and inspectors will be provided with radio and cellular telephone access that is operational in all work areas and access routes to allow for immediate reporting of fires. All fires will be reported to the fire agencies with jurisdiction in the area upon discovery of the ignition. ▪ While performing stationary ground-level jobs or activities from which a spark, fire, or flame may originate (for example, welding, cutting, grinding), all flammable material (for example, grass, leaf litter, dead or dying tree) must be removed down to the mineral soil around the operation for a minimum of 10 feet. ▪ PG&E General Requirements for Wildfire Mitigation (R1 to R3) apply for PG&E work areas located farther than 5 miles from an FIA when the nearest FIA has an elevated FPI rating (R4, R5, or R5-Plus), except during NWS Red-Flag Warnings and Fire Weather Watch events when R5 mitigations will apply. ▪ For work within an FIA, during Red-Flag Warning and Fire Weather Watch events, as issued by the NWS, and elevated PG&E Utility FPI rating (R4, R5, or R5-Plus), all construction activities will refer to the current PG&E Standard TD-1464S and related requirements such as PG&E Wildfire Prevention Contract Requirements, Attachment 1 – Wildfire Mitigation Matrix, and Attachment 2 – Wildfire Risk Checklist Fire Mitigations. With the increased potential fire risk of R4, additional water resources are required, and a working fire watch is assigned to be able to continue work as long as the weather conditions are evaluated to ensure it remains safe to continue work. ▪ For R5 and R5-Plus ratings, measures beyond R1 to R4 levels include posting a dedicated fire watch at the jobsite, making available a trailer-mounted water tank or alternative water delivery method at the jobsite, and modifying the fuel sources surrounding the jobsite. All planned work is suspended during an R5-Plus fire rating. During all emergency work being performed for an R5-Plus fire rating, personnel must have a PG&E Safety and Infrastructure Protection Team on standby or a 300-gallon water tender available. Use of heavy equipment (blades, dozers, skid steers, excavators, back hoes), construction hot work, and electrical equipment work (including tasks related to conductors, pole, and overhead equipment from which a spark, fire, or flames may originate) are allowed with the R5 mitigations in place but not allowed during R5-Plus conditions.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

4. Description of Alternatives

This chapter considers and discusses alternatives to the project, consistent with the California Environmental Quality Act (CEQA) Guidelines, Section 15126.6. It is prepared in accordance with the CPUC *Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments*, which assumes an EIR will be prepared for the proposed project, unless CPUC CEQA unit staff make a preliminary determination during pre-filing consultation that a Mitigated Negative Declaration is likely. The description of alternatives is provided in this chapter of the Proponent's Environmental Assessment (PEA), and the comparison of each alternative to the proposed project is provided in Chapter 6, Comparison of Alternatives. The project is described in detail in Chapter 3, Project Description, of this PEA.

Because the CPUC anticipates that an EIR may be prepared for the state environmental document, this PEA section has been prepared consistent with CEQA requirements to support the CPUC action. CEQA Guidelines Section 15126.6 states that an "EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternative." The alternatives considered must represent a reasonable range of potentially feasible alternatives that foster informed decision-making and public participation. An EIR is not required to consider alternatives that are not feasible. The rationale for selecting the alternatives should be discussed.

Section 4.1 discusses the alternatives evaluation methodology. Section 4.2 lists alternatives considered and describes those carried forward for analysis. Section 4.3 provides a description of the No Project Alternative. Section 4.4 discusses alternatives that were rejected and the reasons for the rejection.

4.1 Alternatives Evaluation Methodology

As noted in the CEQA Guidelines Section 15126.6(a), the alternatives described in an EIR must feasibly accomplish most of the basic project objectives, should reduce or eliminate one or more of the significant impacts of the proposed project, and must be potentially feasible. To comply with these requirements, PG&E screened potential alternatives based on three criteria:

1. *Does the alternative meet most basic project objectives?*

   Section 15124(b) of the CEQA Guidelines requires that an EIR contain a clearly written statement of objectives to help the lead agency develop a reasonable range of alternatives to the proposed project to evaluate in the EIR. Moreover, a project may not limit its objectives in such a way as to effectively confine the range of feasible alternatives that are available. The project objectives are discussed in Chapter 2.

   The purpose of this project is to replace power line equipment that has reached the end of its useful life, to ensure adequate line clearances between the ground or land use, and to reconductor existing project power lines to accommodate future energy needs in the north Oakland area. The project is needed for safe operation of the lines. Refer to Chapter 2 for additional discussion of the project purpose.

   PG&E has identified the following objectives for the project:

   - Provide lifecycle updates of the Moraga–Oakland X 115 kV four circuit power line path by removing and replacing four circuits to avoid future reliability issues while maintaining safe operations.
   - Replace four project power line circuits using a larger size conductor that will accommodate the region's reasonably foreseeable future energy demands.

- Ensure the project at completion meets power line reliability and safety requirements and industry standards.
- Construct a safe, economical, and technically feasible project that minimizes environmental and community impacts.

2. *Does the alternative avoid or substantially lessen any significant environmental effects of the proposed project (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the proposed project)?*

   Per Section 15126.6(a) of the CEQA Guidelines, alternatives considered must "avoid or substantially lessen any of the significant effects of the project." Based on the analysis presented in Chapter 5, Environmental Analysis, the project is not expected to result in significant impacts. Nevertheless, PG&E evaluated alternatives based on their potential to reduce environmental impacts, including the following potential impacts:

   - Conflicts with existing land uses
   - Noise and air quality impacts from construction
   - Impacts to visual resources
   - Impacts associated with wildfire

3. *Is the alternative feasible?*

   As defined by Section 15364 of the CEQA Guidelines, "feasible" means capable of being accomplished in a successful manner within a reasonable time period, taking into consideration economic, environmental, legal, social, and technological factors. PG&E considered these factors in evaluating the overall list of potential alternatives. To evaluate the feasibility of different alternatives, PG&E considered the evaluation factors in Table 4.1-1.

Table 4.1-1. Evaluation Factors and Existing Setting

Evaluation Factors	Existing Setting
Constructability and Maintenance	▪ Site side slope ▪ Work area access and staging ▪ Use of typical construction equipment (cranes and helicopters) ▪ Geotechnical conditions, including crossing of known faults and landslide-prone regions ▪ Road width and road geometry
Compatibility with Land Use and Land Ownership	▪ Land ownership and jurisdiction, including need for new ROW ▪ Conservation easement ▪ Land use ▪ Removal of existing residential buildings ▪ Restrictions on use of properties (for replacement lines)
Compatibility with Infrastructure	▪ Existing utilities and facilities ▪ Other linear facilities
Protection of Resources	▪ Wetlands and waterways ▪ Historic landmarks and historic places ▪ Visually sensitive areas ▪ Wildfire risk ▪ Biological resources

4.2 Alternatives Considered

4.2.1 Process to Identify Potential Alternatives to the Project

PG&E obtained input on potential alternatives from CAISO, community and agency stakeholder information, and project planners and engineers. The public outreach process is described in Chapter 2. In developing alternatives for consideration in this PEA, PG&E considered the following factors:

- Alternatives to the proposed project that were proposed to CAISO. This includes feedback from CAISO on PG&E's proposed project that was included in CAISO's 2019-2020 Transmission Planning Process.
- Alternatives suggested during resource agency, local government, and public outreach. In particular, in 2023, community members expressed an interest in an alternative that would place the lines underground through the Montclair neighborhood area (Montclair) within the City of Oakland.
- Project phasing. No alternatives were identified for project phasing because the entire project must be built to meet basic objectives. Ongoing periodic replacement of small numbers of structures is incorporated in the No Project Alternative.
- Alternatives using the existing ROW. Primarily, this would be to place the lines underground within the existing ROW. This was deemed infeasible based on several issues, including steep and varying topography and lack of access to the ROW by construction and maintenance vehicles that would be required for underground lines. Undergrounding along the existing ROW also would result in major tree removal, ground disturbance to residential landscaping, and removal of existing residential structures. Therefore, underground in the existing ROW was not considered as an alternative.
- Alternative replacement locations outside the ROW. PG&E reviewed multiple alignment locations for overhead and underground alignments for different portions of the replacement.
- Engineering alternatives, including different overhead conductor type and different underground cable configurations. Alternatives with three or more overhead and underground segments along the same circuit would require a transition station at one end of an isolated underground segment instead of using transition structures. A transition station would be required to protect the conductor in the event of an electrical fault occurrence along the alignment. A transition station for four circuits would be approximately 0.5 acre in size and similar to a substation design with a level and rocked surface area and perimeter fence. Covered cable would further reduce wildfire risk compared to the project; however, it is too heavy and is not available for power lines at this voltage.
- Renewable energy, energy conservation, energy efficiency, demand response, distributed energy resources, and energy storage. The potential for alternatives of this type was limited. For example, feasible reductions in energy use from energy conservation/energy efficiency would not be sufficient to eliminate the need for the four Moraga–Oakland X 115 kV circuits. Distributed energy sources and energy storage alternatives have been included for completeness.
- Power lines paralleling or crossing the Hayward Fault underground would need to accommodate fault creep and coseismic displacement measured in feet, rather than in inches, which a typical underground power line can accommodate. An innovative, unprecedented design would be required to conceptually accommodate the movement of the lines expected from the maximum credible earthquake on the Hayward Fault. This degree of displacement likely would require construction of a tunnel (of approximately a 10-foot diameter or more) with tracks from which the cables would hang. The tracks would move to accommodate a potential range of displacement. Construction of such a tunnel would be extremely costly but would still leave residual risk. In the general area, either side of the Hayward Fault zone has topography and structures that are not compatible land use for the multi-acre construction work areas required at the ends of a potential tunnel. In addition, the cable that would be used is fragile and may not be able to withstand this degree of displacement. The length of the section under the fault would make locating and addressing faults more difficult, leading to longer outages. The resulting lines may not be sufficiently reliable. Because of these

geotechnical conditions and insufficient space for construction work areas, extending power lines under the Hayward Fault was considered imprudent and was not carried forward.

The project already incorporates design strategies to reduce its footprint, including the use of monopole tubular steel poles and lattice steel poles instead of traditional towers where feasible, some longer spans that eliminate a few structures, and use of existing ROW where feasible. All underground routes discussed in this section assumed the same double-circuit duct bank and triplex XLPE cable configuration as the proposed project underground route in Park Boulevard.

As a first step in developing some of the alternatives, PG&E considered possible route segments or alternatives outside of the existing alignment for each of the three main sections – eastern, central, and western. The different topography and land use in each section present different opportunities and constraints to be evaluated separately. The section routes then could be combined with each other or sections of the project to create complete alternatives. The following subsections describe the routes considered for each section. The routes are shown on Figures 4.2-1a through 4.2-1d.

4.2.1.1 Eastern Section

The eastern section extends from Moraga Substation to the border between Alameda and Contra Costa counties, which is approximately at Manzanita Drive for the project alignment. A new overhead ROW in the vicinity of the existing alignment was determined to be infeasible because it would require new CEs and extensive grading and vegetation removal, resulting in greater aesthetic and biological resource impacts than the proposed project. Use of the existing ROW is the most feasible overhead option in the eastern section and would have the fewest environmental impacts.

PG&E evaluated use of the existing roads in this section, including unpaved fire roads and a paved road, for an underground replacement. Routes considered for the eastern section are as follows (refer to Figure 4.2-1b):

- Watertank Underground Route. This route would follow the existing alignment on the PG&E substation parcel west from Moraga Substation. At the third set of power line structures west of the substation, the route would follow an existing fire road to the northwest across two CEs that are anticipated to transfer to EBMUD. The route continues through a gate where the existing fire road enters EBRPD Sibley Volcanic Regional Preserve and passes by an existing water tank (including portions of Round Top Loop Trail and Water Tank Road). At the intersection of Water Tank Road and Skyline Boulevard, it would continue southeast on Skyline Boulevard to the intersection with Manzanita Drive for a total of approximately 3.5 miles from the substation.
- Pinehurst Underground Route. This route would be the same as the Watertank Underground Route from Moraga Substation to the third set of power line structures west of the substation, where the route would continue to follow the alignment where it crosses a CE southwest toward the fourth set of structures. Near the fourth set of structures, the route turns westward and follows a fire road within the CE to the McCosker sub-area of EBRPD Sibley Volcanic Regional Preserve. At this point, the route would follow existing fire roads generally south and southwest along existing unpaved fire roads that include portions of the McCosker Loop Trail, the Gudde Ridge Trail, and the Ninebark Trail and go past the planned group campground before arriving at the Eastport Staging Area at Pinehurst Road. It would then follow Pinehurst Road to its intersection with Skyline Boulevard (both paved) for approximately 3.0 miles in total.

Both the Watertank Underground Route and Pinehurst Underground Route would require a new ROW through EBMUD and EBRPD lands, CE modifications, and use of franchise rights. In addition, substantial civil engineering would be required, including grading and improvements to existing fire roads and county roads, widening roads to approximately 25 feet or more, installing retaining walls, reinforcing duct banks, and other civil infrastructure work to address geological conditions such as landslides. Refer to Section 4.2.3.2 for additional details on constraints for constructing underground power lines in the hills in this part of the East Bay.

Although these underground routes would reduce wildfire risk and eliminate aesthetic impacts of aboveground structures, they likely would have significant impacts to biological resources, hydrology/water quality, and land use and introduce new aesthetic impacts from new grading, roadways, and retaining walls. EBRPD and EBMUD have provided input that an overhead replacement is more compatible with their land use and both districts have expressed concern about an underground option in their jurisdictions based on the extensive temporary and permanent road widening of existing fire roads necessary to accommodate construction of the lines and maintain them during the operations and maintenance phase of the project. In addition, modification to the Moraga Creek Open Space Area and Indian Valley Preserve Area Conservation Easement and Western Hills Open Space Area Conservation Easement would be a multiyear process and the schedule to replace the aging infrastructure would be extended significantly. After consulting with the California Department of Fish and Wildlife, United States Fish and Wildlife Service, and the CE administrator, Wildlife Heritage Foundation, PG&E received input that there is a plausible risk that a new easement through the CE could be denied by any of the responsible agencies that administer the CEs. As a result, PG&E determined that the Watertank and Pinehurst Underground Routes are not feasible and they were not considered as part of an alternative.

4.2.1.2 Central Section

The central section extends from approximately the Contra Costa County-Alameda County border near Manzanita Drive to SR 13. A new overhead ROW in the vicinity of the existing alignment was determined to be infeasible because this section generally is built out with residential development. All routes are assumed to use an overhead crossing of the Hayward Fault if located adjacent to SR 13. As noted previously, having three or more overhead and underground portions of the line between substations would require transition stations instead of transition structures.

PG&E evaluated the existing roadways in the vicinity of the existing alignment for underground replacement. Routes considered for the central section are as follows (refer to Figure 4.2-1c):

- Manzanita Drive Underground. This roadway, approximately 1.0 mile between Pinehurst Road and Colton Boulevard, could serve as a portion of an underground route in the central section.
- Skyline Boulevard Underground. This roadway, approximately 0.8 mile between Pinehurst Road and Colton Boulevard, is an option instead of Manzanita Drive for a portion of an underground route in the central section.
- Colton Boulevard Underground. This underground route of approximately 2.0 miles would start at the intersection of Colton Boulevard with Manzanita Drive and Skyline Boulevard and follow Colton Boulevard south, with a brief diversion onto Heartwood Drive, then back onto Colton Boulevard and to Mountain Boulevard. It would head southeast on Mountain Boulevard to the northwest intersection of Mountain Boulevard and Scout Road. There, it would transition to an overhead route to cross SR 13 and the Hayward Fault. This route would be within the Hayward Fault zone along Mountain Boulevard. Therefore, this route would require an innovative, unprecedented design along Mountain Boulevard to conceptually accommodate the movement of the lines expected from the maximum credible earthquake on the Hayward Fault, as described previously in this section. Two approximately 10-foot wide tunnels conceptually would fit in the approximately 51-foot wide Mountain Boulevard.
- Snake Road Underground. Similarly to Colton Boulevard, this underground route would start at the intersection of Snake Road with Manzanita Drive and Skyline Boulevard and follow Snake Road south to Mountain Boulevard to the intersection with Scout Road for approximately 1.9 miles, where it would transition to overhead to cross SR 13 and the Hayward Fault.
- Shepherd Canyon Road Underground. This route would be overhead and transition to underground at approximately the intersection of Saroni Drive and Gunn Drive, and then go south in Saroni Drive for approximately 0.1 mile to Shepherd Canyon Road, then progress westbound for approximately 1.0 mile. The line would transition to aboveground in a transition station near the City of Oakland

Municipal Service Yard and connect to structures in the existing ROW. The total length of underground route would be approximately 1.1 miles.

- Redwood Peak Tunnel. Historically, the Sacramento Northern Railway used an approximately 3,700-foot-long tunnel under the Oakland Hills between Montclair (approximately at Saroni Drive and Shepherd Canyon Road) and Eastport on Pinehurst Road near EBRPD's Eastport Staging Area where the Pinehurst Underground Route transitions to Pinehurst Road.

Skyline Boulevard Underground was determined to have more severe landslide issues than Manzanita Drive Underground, so it was not considered further. Snake Road Underground is in proximity to Colton Boulevard Underground but, similarly, has issues with road width, curvature, and potential landslides, so it was not considered further. The Sacramento Northern Railway tunnel has been filled in, is of unknown structural condition and may have collapses, and does not have sufficient multi-acre work areas at either end of the tunnel for construction to rebuild for power line use, so it was not considered further.

Manzanita Drive Underground, Colton Boulevard Underground, and Shepherd Canyon Road Underground were considered for development of alternatives.

4.2.1.3 Western Section

The western section extends from SR 13 to Oakland X Substation. PG&E evaluated existing roadways in the vicinity of the existing alignment for underground replacement routes. In all cases, the routes would start overhead after crossing SR 13 and then would transition to underground; at Oakland X Substation, they would transition to aboveground. In addition, PG&E evaluated use of the existing power line ROW for an overhead alignment to Oakland X Substation. A new overhead ROW in the vicinity of the existing alignment in the western section was determined to be infeasible because the area is fully built out and removal of residences would be required.

Routes considered for the western section are as follows (refer to Figure 4.2-1d):

- Estates Drive Underground. This underground route would start from the existing ROW and extend northwest in Monterey Boulevard to the intersection of Park Boulevard. The route then would continue overland northwest up an undeveloped hillside to the west of the southbound SR 13 off-ramp north of the intersection of Trafalgar Place and Park Boulevard. The route then would split to have one double-circuit duct bank in each of Sims Drive and Somerset Road, then rejoin at Estates Drive to extend south to Park Boulevard. This route would be combined with the proposed project's underground segment from the intersection of Estates Drive and Park Boulevard to Oakland X Substation for a total of approximately 2.2 miles.
- Trestle Glen Road Underground. This underground route would follow Trestle Glen Road from Park Boulevard south to Grosvenor Place and then to Oakland X Substation. This route would be combined with the proposed project's underground segment from the intersection of Estates Drive and Park Boulevard that proceeds southwest along Park Boulevard to the intersection of Trestle Glen Road for a total of approximately 1.4 miles.
- Lincoln Avenue Underground. This underground route would start from the existing ROW and extend southeast on Monterey Boulevard. It would continue southwest on Lincoln Avenue; then northwest on MacArthur Boulevard, which turns into Excelsior Avenue; then north on Kingsley Street, which turns into Park Boulevard Way; and then transition aboveground on a transition structure at Oakland X Substation for a total of approximately 3.1 miles. This route would be within the Hayward Fault zone along Monterey Boulevard and across Lincoln Avenue. Therefore, this route would require an innovative, unprecedented design along Monterey Boulevard to conceptually accommodate the movement of the lines expected from the maximum credible earthquake on the Hayward Fault, as described in Section 4.2.1.2. An approximately 10-foot-wide tunnel would fit conceptually in the approximately 27-foot-wide Monterey Boulevard and in the 40-foot-wide Lincoln Avenue.
- Park Boulevard between SR 13 and Estates Drive Underground. Instead of transitioning to underground at Estates Drive and Park Boulevard, the lines would transition to underground just

west of SR 13 and continue underground northwest in Monterey Boulevard to Park Boulevard and southwest to Estates Drive. This route would be combined with the proposed project's underground segment from the intersection of Estates Drive and Park Boulevard that proceeds southwest along Park Boulevard toward Oakland X Substation for a total of approximately 2.0 miles.

- Western Overhead. This route would reuse the existing ROW between the Estates Drive/Park Boulevard intersection and Oakland X Substation by placing the lines overhead for approximately 1 mile.

The Trestle Glen Road Underground option was eliminated because it would connect the same points as the proposed project's underground route on Park Boulevard but would have greater constructability issues. Trestle Glen Road has a narrow street width and has several existing buried utilities. It is unlikely to accommodate one double-circuit duct bank. In addition, Trestle Glen Road is not as straight as Park Boulevard and may require more vaults. While the length of the underground portion would increase only by approximately 0.1 mile, the cost would be greater because of having to place the duct bank below the many existing utilities and potentially to add a greater number of vaults. The longer underground portion, the longer construction period, and the potential need for slope reinforcement would likely have greater impacts to adjacent properties than the Park Boulevard alternative route. Additionally, another route would be needed for the second double circuit.

The Park Boulevard between SR 13 and Estates Drive Underground route was not retained because it would pose too much risk to public safety and adjacent properties based on design issues, so it was eliminated. Park Boulevard north of Estates Drive is supported by three bridges (viaducts) under the roadway (refer to Figure 4.2-1d) that are located within approximately 1,600 feet of Park Boulevard north of Estates Drive. Underground construction in this portion of Park Boulevard would require avoidance and setback from the girders and other bridge structures. PG&E would be forced to excavate into the hillside along the northwest side of Park Boulevard to accommodate a ROW space for both duct banks. This excavation of steep uphill slopes poses a landslide risk to upslope residential structures along Estates Drive. If the route circumvented three bridge structures on the southeast side of Park Boulevard, PG&E would need to install retaining walls on the downslope side of the hill, which could pose a safety risk by undermining the bridge structures.

A variation of the Park Boulevard segment was considered where the overhead line would transition underground in Park Boulevard just west of SR 13 and then aboveground northeast of the bridge structures, a length of approximately 1,300 feet. Before transitioning to underground within Park Boulevard west of SR 13, a new overhead span at SR 13 and the Hayward Fault would be needed from the existing alignment (structures RN21 and RS21 on the northeast side of SR 13) to two new structures west of the intersection of Trafalgar Place and Park Boulevard. The area west of this intersection is approximately 60 feet lower than RN21 and RS21. The four circuits then would have short spans to connect to transition poles, either in the same general location or in Montclair Golf Course across Park Boulevard. After the underground length of approximately 1,300 feet with approximately two vaults, an approximately 0.5-acre transition station would be required at the southern end of the isolated underground segment, likely along the south side of Park Boulevard along or in Dimond Canyon Park. Retaining walls or reinforced duct banks may be needed in some locations based on landslide risk. From the transition station, new spans across Dimond Canyon Park would cross back to the existing alignment. Refer to Section 4.2.3.2 for a discussion of transition stations and landslide risk. Overall, this variation would result in the elimination of four to six structures in the existing alignment (possibly RN22, RS22, RN23, RS23, RN24, and/or RS24; refer to Figure 3.5-1), while adding two new structures, four transition poles, and a transition station with four transition poles to install an isolated underground segment. Because of the cost and impacts of the variation and the minimal benefit, this variation was not carried forward.

Estates Drive Underground, Lincoln Avenue Underground, and Western Overhead were considered for development of alternatives.

4.2.2 Identified Alternatives

PG&E evaluated the section routes that were not eliminated in combination with each other and with sections of the project to create alternatives for consideration, in addition to system-level and other alternatives. Based on the information presented in Section 4.2.1, PG&E identified eight alternatives to the project, as follows:

A. Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground (Figure 4.2-2)

B. Manzanita Drive-Colton Boulevard-Estates Drive Underground (Figure 4.2-3)

C. Shepherd Canyon Road Underground (Figure 4.2-4)

D. All Overhead Rebuild in Existing Alignment (Figure 4.2-5)

E. Proposed Project with Campground Overhead Option (Figure 4.2-6)

F. Conceptual South Overhead Alignment (Figure 4.2-7)

G. Distributed Energy Resources

H. Energy Storage

These alternatives were evaluated against the criteria discussed in Section 4.1. As discussed in Section 4.2.1, PG&E considered multiple alternatives, including both aboveground and underground configurations, and multiple locations. Nearly all the alternatives did not meet some project objectives, and most had significant technical and economic feasibility issues as well as greater impacts to some environmental resources. Ultimately, alternatives were identified that represented a range of locations and configurations to show the public why the proposed project is superior to other alternatives analyzed for technical and economic feasibility and impacts to some environmental resources. Two of the alternatives (Alternative A and Alternative E) also had been shared with stakeholders.

The alternatives are discussed in the following subsections. Figures 4.2-2 to 4.2-7 provide maps of the alternatives. Table 4.2-1 summarizes the alternatives evaluation. The alternatives are described in more detail following Table 4.2-1. Bold text in the first column indicates an alternative carried forward for consideration in this PEA.

4.2.3 Alternatives Carried Forward for PEA Evaluation

Four alternatives, Alternatives A, B, C, and E, in addition to the No Project Alternative, are carried forward for evaluation in this PEA. These alternatives are shown on Figures 4.2-2, 4.2-3, 4.2-4, and 4.2-6 and are described in the following subsections. These alternatives were selected because they meet the underlying purpose of the proposed project, meet some of the project objectives, incorporate feedback from stakeholders, and represent a reasonable range of alternatives to the project. As noted earlier in this chapter, the proposed project is not expected to result in potentially significant impacts.

4.2.3.1 Alternative A: Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground

Description

This alternative would replace three of the four existing Moraga–Oakland X circuits on two sets of structures in an overhead configuration (refer to Figure 4.2-2). Two circuits would be placed on a double-circuit structure and one circuit would be placed on the adjacent structure, similarly to the existing two sets of structures. The northern circuit and southern circuit would always remain on the northern and southern set of structures, respectively. The middle circuit between these two circuits would oscillate between the northern and southern set of structures, and the northern and southern circuits would move from the outside position to the inside position when the middle circuit was on the other set of structures to minimize ROW modification. The three circuits would be built within the same ROW from Moraga Substation to the intersection with Monterey Boulevard.

From there, the northern and middle circuits would continue in an overhead configuration on one set of double-circuit structures to Estates Drive/Park Boulevard. The two circuits would transition to underground at the northwest corner of Estates Drive and continue down Park Boulevard (one single-circuit duct bank on each side of the roadway) to Park Boulevard Way and terminate at Oakland X Substation. Each circuit would be installed in a separate duct bank with a minimum 15 feet of separation. The other circuit would be installed underground in Monterey Boulevard and progress southeast toward Lincoln Avenue; then continue southwest on Lincoln Avenue before turning northwest on MacArthur Boulevard, which turns into Excelsior Avenue; then north on Kingsley Street, which turns into Park Boulevard Way; and then transition aboveground on a transition structure at Oakland X Substation for a total of approximately 3.1 miles. In addition, Alternative A would include reconductoring two portions of the Moraga–Claremont Circuits 1 and 2 115 kV lines (approximately 3 miles total), which would include installation of new structures and conductors and removal of existing structures and conductors, primarily in parks and open space. The eastern end of the reconductoring would be within the eastern extent of the Montanera Wilder Conservation Easement and adjacent to the western edge of the Lost Valley residential neighborhood in Orinda. The eastern half of the western end of the reconductoring would cross portions of EBMUD watershed and EBRPD Sibley Volcanic

Table 4.2-1. Summary of Alternatives Evaluation

Potential Alternative	Project Purpose and Objectives Criterion	Feasibility Criterion[a]	Environmental Criterion[b]
A. Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/ Lincoln Avenue Underground	Meets project purpose and most objectives.	Alternative would be more expensive because of Moraga–Claremont reconductoring and greater length of underground duct bank installation. Would require an innovative, unprecedented design along Monterey Boulevard and the eastern portion of Lincoln Avenue to accommodate movement expected from Hayward Fault.	Impacts likely greater than the project because of larger construction footprint, which would be nearly the same along the Moraga–Oakland X project alignment and would add impacts along an additional approximately 2 miles of Moraga–Claremont power line and construction impacts along the approximately 3.1 miles of the Lincoln Avenue Underground Route portion.
B. Manzanita Drive-Colton Boulevard-Estates Drive Underground	Meets project purpose and most objectives.	Extensive engineering and constructability issues that may make this alternative not economically or technically feasible. Would require significant road stabilization projects and may require demolition of homes and restrictions on use of adjacent properties. Would require an innovative, unprecedented design along Mountain Boulevard to accommodate movement expected from Hayward Fault.	Reduces permanent visual and wildfire impacts compared to the project. Construction impacts would be greater than the project for some resource areas such as traffic, safety, and air quality because of the scale of construction required for the additional underground portion. Significant and unavoidable impacts may occur to population and housing and land use based on loss of existing housing and restrictions on future uses of property.
C. Shepherd Canyon Road Underground	Meets project purpose and most objectives.	Extensive engineering and constructability issues that may make this alternative not economically or technically feasible. Would require extensive geotechnical stabilization of roadway and slopes and may require demolition of homes and restrictions on use of adjacent properties.	Reduces permanent visual and wildfire impacts compared to project. Construction impacts would be greater than the project for some resource areas such as biological resources, transportation, safety, and air quality because of the scale of construction required for the additional underground portion. Significant and unavoidable impacts may occur to population and housing and land use based on loss of existing housing and restrictions on future uses of property, and to transportation from extended closure of Shepherd Canyon Road.
D. All Overhead Rebuild in Existing Alignment	Meets project purpose and most objectives.	May not be technically feasible because of constructability issues in the western section.	Most impacts would likely be similar to the project. Land use impacts may be greater because of proximity to homes in the western section. Greater aesthetic impacts than the project because underground replacement would not occur.
E. Proposed Project with Campground Overhead Option	Meets project purpose and most objectives.	Alternative is feasible. Additional easement would be required. Introduces new angle in the power lines replacement, requiring larger structures.	Impacts would likely be similar to the project with greater impacts to biological resources from EBRPD tree removal for compliance with CPUC GO 95. Minor aesthetic impact reduction with two spans shifting slightly farther away from EBRPD campground.

Table 4.2-1. Summary of Alternatives Evaluation

Potential Alternative	Project Purpose and Objectives Criterion	Feasibility Criterion[a]	Environmental Criterion[b]
F. Conceptual South Overhead Alignment	Meets project purpose and most objectives.	Not legally or economically feasible. Would require extensive new ROW. Substantially greater cost because of the greater length and acquisition of new ROW.	Impacts would be substantially greater than the project because of the significantly increased length of the project and associated construction impacts. Existing CEs in the eastern section prohibits new development. Significant biological and aesthetic impacts from new alignment in parks and open space.
G. Distributed Energy Resources	Would not meet project purpose or objectives.	Not technically feasible to provide sufficient distributed resources to eliminate need for Moraga–Oakland X path.	Unable to determine because exact improvements are unknown.
H. Energy Storage	Would not meet project purpose or objectives.	Not technically feasible to provide sufficient energy storage to eliminate need for Moraga–Oakland X path.	Unable to determine because exact improvements are unknown.

[a] Considers economic, environmental, legal, social, and technological factors.

[b] Proposed project will not result in significant environmental impacts.

Bold = alternatives carried forward in the PEA.

Regional Preserve and most of the western half is adjacent to the southern edge of the City of Oakland's North Oakland Sports Center ball fields. The western half of the western portion would cross or parallel roads with adjacent residential use such as Grizzly Peak Boulevard, Skyline Boulevard, Balsam Way, Pine Needle Drive, Broadway Terrace, Gwin Road, Fairlane Drive, Swainland Road, Pali Court, Glenarms Drive, and the northern extent of Mountain Boulevard.

Construction activities for the overhead replacement of the Moraga–Oakland X lines would be similar to the project, including installation of new and removal of existing structures and conductors. Modifications to Moraga and Oakland X substations would be similar to the project with the addition of minor modifications to the Moraga–Claremont line terminals. Construction activities for this alternative would be more extensive than the project, given the additional construction activity to reconductor the Moraga–Claremont line, including additional pull sites and helicopter use and potential structure replacement, and construction activities for the Lincoln Avenue Underground route. As discussed previously, this route would require an innovative, unprecedented design along Monterey Boulevard and in the eastern portion of Lincoln Avenue to conceptually accommodate the movement of the underground line expected from the maximum credible earthquake on the Hayward Fault.

Rationale for Carrying Forward

Alternative A had been one of PG&E's Northern Oakland Area Reinforcement projects, and it represents a different engineering alternative with a different type of overhead conductor and underground cable configuration. This alternative would meet the project objectives.

Public and Agency Comments

Alternative A was shared with the CPUC and some local jurisdictions as part of earlier project development and was included as a potential alternative presented at the April 2024 open house. No specific negative comments were noted.

4.2.3.2 Alternative B: Manzanita Drive-Colton Boulevard-Estates Drive Underground

Description

This alternative would incorporate the Manzanita Drive and Colton Boulevard underground routes described in Section 4.2.1.2 (refer to Figure 4.2-3). It would replace the existing Moraga–Oakland X 115 kV lines by replacing overhead lines in the existing ROW in the eastern section, in Contra Costa County, the same as the proposed project. From there, the route would transition belowground near Manzanita Drive and follow Manzanita Drive west to Colton Boulevard, with two double duct banks in the roadway. The underground alignment then would follow Colton Boulevard south, with a brief diversion onto Heartwood Drive, then back onto Colton Boulevard to Mountain Boulevard. It would head southeast on Mountain Boulevard to the northeast intersection of Scout Road, where it would transition to overhead to cross over SR 13 and the Hayward Fault. It would transition underground west of SR 13 within an undeveloped hillside northwest of the intersection of Trafalgar Place and Park Boulevard. From there, the alignment would go southwest with one double-circuit duct bank in Sims Drive and one double-circuit duct bank in Somerset Road. Both duct banks would rejoin within Estates Drive and continue to Park Boulevard, progress southwest within Park Boulevard to Park Boulevard Way and terminate at Oakland X Substation. This alternative would have approximately 1.6 miles of lines replaced overhead, approximately 4.2 miles of lines replaced underground, and multiple transitions between overhead and underground sections.

This alternative would have similar construction activities as the project for replacing the eastern section overhead; constructing the underground portion on Park Boulevard between Estates Drive and Oakland X Substation; removal of the existing overhead Moraga–Oakland X 115 kV lines in all the central and western sections after replacing underground; and modifications to Moraga and Oakland X substations.

Transition Station

To achieve reliable line operation, system protection equipment needs to be interset on a hybrid line with multiple section lines. Where neither end of an underground segment of a power line is connected to a substation, a transition station is required to provide system protection information indicating approximately where an electrical fault in the line has occurred. An electrical fault in this context means the flow of electricity is interrupted. An electrical fault can occur in both overhead and underground lines and can happen during several conditions, such as when a tree branch falls onto the line, there is an unanticipated dig into the duct bank, land movement impacts the duct bank, during power surges, or when the flow of electricity in the line is otherwise interrupted. Overhead power lines can have temporary, semi-temporary, and permanent fault conditions. Temporary faults include when a tree branch falls on a conductor long enough for a fault to occur, but then it falls off the conductor of its own accord. A semi-temporary fault is similar to a branch falling on a conductor but then the branch does not fall off by itself and instead requires removal by an electrical worker. Permanent faults such as damage to an underground cable or overhead conductor require replacement of the material before the system can be reenergized.

When a fault happens on a line, advanced safety technology can turn off the line within 0.1 second. Before restarting the line, protection equipment at a substation calculates the approximate distance from the substation to the electrical fault location on the circuit. This approximate distance is communicated to a field team who will inspect the potential electrical fault location to determine what occurred and perform any maintenance required before requesting the flow of power through the line be restarted. When a line has an isolated underground segment, the substation protection equipment is unable to determine if the fault occurred in the underground segment or the overhead segment. In consideration of the distinct operation characteristics of overhead and underground circuits, field crews are trained to conduct either overhead maintenance or underground maintenance. When an electric fault occurs on a hybrid line, potentially both types of field crews would be mobilized instead of a single field crew type for a nonhybrid circuit. Without a transition station, addressing faults and restoring power would take substantially longer because potentially the entire length of line would need to be inspected (beginning by inspecting vault by vault) before being able to identify the electrical fault location through a process of elimination. Without protection equipment at one end of an isolated underground segment, reliability may fall to unacceptable levels with the slow inspection process. A transition station at one end of an isolated underground segment will include protection equipment that can estimate the approximate fault location on the underground segment and thereby reduce the amount of time required to inspect and restore power.

A transition station needs to include adequate separation between cable vaults for the incoming underground lines, a riser structure for each circuit, a communication enclosure with protection equipment, and other related equipment within security fencing. A transition station needs to have a relatively flat yard area with safe vehicular access to all equipment for maintenance during varying weather and day or nighttime conditions.

A transition station for this project would occupy approximately 0.5 acre to accommodate the four 115 kV circuits and associated station equipment. An example transition station on two PG&E 230 kV lines is shown on Figure 4.2-8. For Alternative B, it is assumed that the transition station would be constructed at the west end of the underground segment because the area contains what appear to be more suitable locations than the eastern end (refer to Figure 4.2-3), including commercial parking lots with existing road access. Transition poles would be used at other transition locations, including the underground segment terminating at Oakland X Substation, which will have the requisite protection equipment within the substation.

Deflection and Landslides

The distance or angle measurement of how a pipe bends or deforms is called deflection. Deflection results when permanent ground displacement occurs. Buried utilities have a range of flexibility. Underground power line cables have a much lower deflection tolerance than other types of utility pipes such as water or sewer. Structural design of buried utility pipes is informed by internal fluid pressure and external soil load. In general, buried utility pipes carrying water are generally considered "flexible pipes," and can tolerate more deflection than underground power cables (Watkins and Smith 1973; PPI 2008). The existing buried utility lines in roads provide local neighborhood service, unlike the power lines that provide power to the north Oakland area, including the Port of Oakland and the City of Alameda. An impact to the buried water or sewer lines would have a localized impact versus the broader impact resulting from a rupture of the project proposed power lines. Repair of water or sewer line typically is completed in a shorter time than repairing underground electric power lines. In an area with a risk of landslides, therefore, underground power lines would be subject to a greater risk of failure than other underground utilities, and the consequences of failure are greater for underground power lines than for other utility lines in terms of both impacts to service and repair time. In addition, there is no feasible option to place water, sewer, and some other utilities aboveground whereas power lines can be installed aboveground.

Based on the cable manufacture guidance (Alverez pers. comm. 2024), the maximum allowable elongation of the triplex XLPE cable bundle is estimated at no greater than 50 millimeters (approximately 2 inches) after installation. The allowable elongation accounts for tightening of the bundle through the approximate maximum 1,300-foot cable lengths between splice vault locations. The cable and the duct bank system would likely be damaged beyond use with any lateral deflection of the duct bank and conduits because of earth movement. Because the cable splices in the vault would be well supported, the more likely failure from displacement would be in the cable between vaults. This is a reliability risk for the electrical system during a seismic or landslide event, when it is important to have these circuits available to provide power to customers. Repair of the underground power lines at that point would require demolition of entire portions of the duct bank and cable, resulting in a long-term outage on the order of 6 months or greater, not including other ground stabilizing construction that would necessarily be performed to stabilize the slope and road prior to repair of the power line facilities.

Design and construction of this alternative's underground portion in the Montclair neighborhood hills of the City of Oakland would entail extensive engineering and constructability issues to address geotechnical conditions. Because of the local geology and soils, the Oakland Hills contain multiple existing landslides and areas of extremely elevated landslide susceptibility. These slides can continue to move for several reasons, including rainfall, earthquakes, and destabilization from construction activities. Movement of these slides is common, although unpredictable, and can be observed in the area; for example, where local roads are cracking. Refer to Figure 4.2-9 for photos of a slide in Novato, California, in an area with similar soils and geology. As can be seen in this image, deep-seated landslides may extend below a valley floor and may uplift soils near the base of the slope.

In addition, seismic activity can cause new slides in areas with steep slopes. This underground portion of Alternative B is near the active Hayward Fault (refer to Section 5.7) and is in an area with steep slopes; therefore, it also would be at risk for seismically induced slides. PG&E used a proprietary regional landslide model (PG&E 2023) and United States Geological Survey (USGS) deterministic seismic input of the Hayward Fault to identify locations with greater than 50 percent probability of exceeding the 2-inch threshold of deformation of a duct bank causing failure of the line from landslides. The spectrum of horizontal ground motion was derived using the USGS Unified Hazard Tool (USGS 2024) with a mean moment magnitude of approximately 7.0 for the design seismic event. Figure 4.2-3 shows these landslides mapped along this underground portion of Alternative B.

The central underground segment of this alternative is in an area with a risk of landslides that could impact the duct banks containing the underground power lines by several feet, which would exceed the displacement tolerance of the cable. A landslide such as this would require reconstruction of the underground line duct bank, as previously noted, which could affect power delivery to large portions of the East Bay for long periods of time. Some power could potentially be rerouted from other area substations for a portion of the distribution customers depending on the seasonal demand. In addition, a long-term temporary overhead line, or shoofly, could be installed to connect with adjacent overhead segments while the duct bank was being designed and replaced. A shoofly typically involves installing tall poles to support overhead conductors as a temporary solution to provide power. The prevalence of landslides in the area presents an unacceptable risk to reliability without engineered protection and additional construction. One option to protect underground power lines is to build duct banks with much thicker reinforced concrete walls using rebar reinforcement; however, greater road width is required for this construction and, as described in the following text, the road widths for a typical duct bank width already represent a constraint. Additionally, there is a practical limit to the amount of reinforcement for a duct bank. Duct bank geometry, reinforcement detailing, and construction means and methods will impact the ability of a reinforced duct bank to be feasible. Geological conditions also can be addressed with retaining walls or other subgrade geotechnical improvements to remediate global slope stability hazards. In either case, substantial in-situ geotechnical information must be collected to evaluate the feasibility of using either reinforced duct bank or other geotechnical improvements to protect the proposed underground power lines.

Exploratory data from geotechnical investigations would be needed from each landslide shown on Figure 4.2-3 before detailed design could be completed. Extensive soil boring sampling would need to be done to collect the data. Typically, a track-mounted drill rig is used to move along a transect and collect soil samples. A boring sample would need to be taken every 50 to 100 feet along a transect from the duct bank location to the top of the landslide as well as one boring above the landslide. These sampling transects would need to be repeated approximately every 200 feet. Boring sampling would require bringing heavy construction equipment, including drilling rigs, onto residential properties. Because of the steep slopes along this alternative's alignment, grading may need to be performed to provide vehicle access to place the drilling rigs at the sampling locations. Trees and shrubs in the access and sampling areas would need to be removed, which could affect much of the existing vegetation on each property. After access and the work area are established, sampling at each location would take approximately 2 days. When working from the roadway, a single lane closure would be required during the geotechnical investigation activity. The exploratory data would confirm whether a retaining wall is needed at each slide location and, if so, the size of wall needed. Land use restrictions such as no changes to buildings or no new trees would be required for all upslope properties to avoid excess loading of the retaining walls or other load-bearing components that could impact the underground line installation.

Typically, retaining walls would be constructed in locations where the duct bank displacement from a landslide could exceed 2 inches. While the length of the wall typically extends along the width of the landslide, the wall design would depend on the depth of the landslide. Shallower landslides may only need a simple retaining wall and a duct bank itself could be designed to be a headwall to deflect soil movement. Moderate landslides may need a retaining wall in the range of 15 to 30 feet high, which would be visible to surrounding areas. Large landslides may require a much more robust wall, for example with tiebacks or rock anchors. Construction of each retaining wall would require removal of vegetation and excavation into the hillside. Installation of a retaining wall can vary from approximately 3 weeks to several months depending on the wall type which can include construction activities such as pile driving. Based on current data, it is assumed a retaining wall of unknown size would be needed along all landslides shown on Figure 4.2-3 to prevent displacement greater than 2 inches.

Road Width

The roadways in the Manzanita Drive and Colton Boulevard underground routes generally are narrow and present constraints to construction. Each of the two double duct banks (each duct bank would contain two circuits) is approximately 4 feet wide. In addition, 15 feet of separation must be maintained between the edges of the two duct banks to address mutual heat generated by each power line circuit and to maintain ampacity, which is the amount of current a conductor can safely carry without exceeding its temperature rating. The 15 feet of separation is a standard for separation of single circuits developed by PG&E through many years of project development. Separating the double duct banks by less than 15 feet would result in too great a loss of ampacity from co-heating and would not achieve the project objective to accommodate load demands in the Oakland area. Therefore, a minimum road width of at least 22 feet is needed to fit both duct banks, not inclusive of other utility obstructions. However, utilities, including sewer and water, natural gas distribution, and telecommunication lines, are expected to be present in the roadways in unknown locations and may present additional constraints if they cannot be relocated to provide enough room for the duct banks.

In addition, temporary construction areas wider than 22 feet would be needed for some construction activities. For example, a typical crane truck for installing precast power line vaults would require a work area of approximately 32 feet by 40 feet and additional space above that to rotate. Conservatively, a typical hydraulic excavator, while only approximately 16 feet wide, requires an approximately 53-foot-wide space to rotate. Required work areas for vaults, approximately 1,500 square feet, also may extend beyond existing road width to accommodate the typical excavation size of approximately 42 feet long by 18 feet wide by 13 feet deep. Typically, the workspace for open trenching operations to install the duct bank between the vaults may extend up to approximately 1,500 feet long by 24 feet wide. Manzanita Drive, Colton Boulevard, Heartwood Drive, Sims Drive, Somerset Road, and Estates Drive are narrow, often less than approximately 25 feet wide. It is likely that the road will need to be fully closed where and when construction is occurring, potentially for up to several weeks at some locations such as where vaults or retaining walls or other geotechnical improvements are constructed. Where road width is not sufficient, temporary or permanent widening of roads may be required. The route has roads that narrow to 20 feet in several locations, which will only accommodate one duct bank and will limit construction work areas and access for some roadway lengths. If roadway width, soil borings, and further design indicated that only one duct bank instead of two would fit in the roadways, construction of another alignment would be required for the second duct bank. That alignment would face similar, if not greater, constructability issues.

Vaults would be constructed along the alignment of similar dimensions (approximately 12 feet wide by 22 feet long by 10 feet tall) and materials as the proposed project. Delivering precast vaults, which would be done for the project, may not be feasible in some locations of the alternative because the large trucks delivering the vaults may not be able to access all locations based on the narrow and winding roads. Additionally, work area constraints would likely prevent cranes from lifting the vaults into place. While vaults can be cast in place, the roadway width feasibility issues would constrain cement trucks and other equipment. When a vault is cast in place, the excavation, installation, and concrete curing of the vault would likely require road closures of 3 to 4 weeks per vault.

Curves in a road create additional tension necessary to overcome friction of cable in the conduit when the duct bank bends around a curve. The splicing action relieves the tension developed by the series of bends by reducing the total degrees of bend the cable must be pulled through during installation. The curves in the roadway would reduce the spacing of the vaults for the alternative and further increase the number of vaults. Because of the much greater length of underground line and greater road curves compared to the project, Alternative B would have many more vaults than the proposed project given the underground portion is approximately 4.2 miles through curving roads versus the proposed project's approximately 1-mile of underground lines in roadway with few curves. The proposed project is anticipated to require approximately 5 to 10 vaults with an average spacing of approximately 1,300 feet per line. Alternative B would have up to approximately 25 to 30 vaults minimum with a maximum spacing at approximately 1,000 feet per line to address the friction created in the cable as it follows the curves of the road. However, numerous splices in an underground power line circuit introduce an increased risk of failure because the circuits are not a solid length of contiguous cable. Additionally, the triplex XLPE cable reels that hold at least 1,300 feet are large and heavy. These cable reels are transported on a semitruck lowboy trailer, which is unlikely to be able to transport the cable reels to installation location on narrower, curvy roadways with undulating or steep grades.

Rationale for Carrying Forward

Alternative B, the Manzanita Drive-Colton Boulevard-Estates Drive Underground Alternative, would meet the project purpose and some of the objectives, although it would not be economical and would not minimize environmental impacts. Exploratory borings and additional design may indicate that the alternative is not technically feasible. The alternative was carried forward because it appears to be one of the less technically constrained options for placing the lines underground through the central section.

Public and Agency Comments

Community members have expressed an interest in an alternative that would underground power lines in residential areas, particularly in the central section.

4.2.3.3 Alternative C: Shepherd Canyon Road Underground

Description

This alternative would replace the existing Moraga–Oakland X 115 kV lines by constructing new overhead lines in the existing ROW in the eastern section in Contra Costa County and part of the central section, the same as the proposed project (refer to Figure 4.2-4). From there, the route would transition underground at approximately the intersection of Saroni Drive and Gunn Drive, which was identified as the first potentially feasible transition location on PG&E-owned land from the eastern boundary of Alameda County. The two double duct banks would go south in Saroni Drive to Shepherd Canyon Road for approximately 0.8 mile. The lines would transition to aboveground near the City of Oakland Municipal Service Yard in a transition station before connecting overhead to structures in the existing ROW to cross SR 13 and the Hayward Fault. It would continue overhead in the existing ROW to the intersection of Estates Drive and Park Boulevard, where it would transition underground in Park Boulevard and Park Boulevard Way to Oakland X Substation. This alternative would have approximately 3 miles of lines replaced overhead and approximately 2 miles of lines replaced underground.

This alternative would have similar construction activities to the project, including replacing the eastern section overhead, removing the western section of the existing lines, building the underground portion on Park Boulevard from Estates Drive to Oakland X Substation, and modifying Moraga and Oakland X substations. This alternative also would remove approximately 1 mile of existing lines in the central section after approximately 1 mile of underground lines were built and in service.

Transition Station

The underground section along Shepherd Canyon Road is not connected to a substation and, therefore, as discussed for Alternative B, this alternative would require a transition station at one end of the Shepherd Canyon underground segment, with transition poles used at the other end of the underground segment transition location. The options for a 0.5-acre space are limited at the north end of this segment. The largest space identified, a small PG&E-owned vacant parcel at the intersection of Gunn Drive and Saroni Drive, is steeply sloped, has landslide potential, is irregularly shaped, and at approximately 0.25 acre, likely is too small. As a result, Alternative C would include the transition station at the southern end of the Shepherd Canyon underground segment in the City of Oakland Municipal Service Yard, which uses an area of approximately 0.9 acre. Use of approximately 0.5 acre in this location for a transition station would require the City of Oakland to sell the land to PG&E. It also likely would require relocation of the Municipal Service Yard to a new unidentified location. The Shepherd Canyon Park field on the east side of Shepherd Canyon Road, across from the Municipal Service Yard, also was considered. However, the loss of parkland is unlikely to be supported by the City of Oakland; Shephard Creek, which runs underground in the field, may constrain the transition station location; and the location would introduce a sharper bend to the underground lines than lines that connect to a transition station in the Municipal Service Yard location.

Two options were identified to connect the aboveground circuits from the Municipal Service Yard to the existing ROW. One option would have the four circuits connect directly from the transition poles south-southwest to the new overhead structures RN20 and RS20, which would result in the lines crossing over a private residence. The other option, which avoids passing over a private residence, would require two new structures in the existing alignment approximately 170 feet southwest of the Municipal Service Yard on the hillside north of Shephard Creek. Connecting the overhead lines to RS19 and RN19 is not reasonably feasible because it would require transition structures 130 feet tall or greater, clearing of vegetation between the transition structures and RS19/RN19, and the replacement of RS19/RN19 with structures 20 to 30 feet taller than the existing.

Deflection and Landslides

Construction of this alternative's underground segment along Saroni Drive and Shepherd Canyon Road would entail extensive engineering and constructability issues. As discussed for Alternative B, the Oakland Hills contain multiple existing landslides. Figure 4.2-4 shows the landslides that were mapped along Shepherd Canyon Road. As discussed in Section 4.2.3.2, these landslides can continue to move, seismic activity from the Hayward Fault can cause new landslides on steep slopes, and Shepherd Canyon Road is at risk from landslides that can be multiple feet deep and lift the roadway and/or move it laterally, causing deflection of the underground lines.

As with Alternative B, the prevalence of landslides in the area presents an unacceptable risk to reliability without engineered protection, which likely would be retaining walls based on road width constraints. Retaining walls would be constructed in locations where the displacement from a landslide could exceed 2 inches. This includes a large landslide area north of Alternative C along Shepherd Canyon Road, west of Paso Robles Drive (refer to Figure 4.2-4). PG&E Geosciences staff conducted a field visit in 2024 at this landslide location to gather observations. The field observations at the ground surface and road cuts included the type of rock, estimate of the strength of the blocks of rock, and how fractured and weathered the rock is. These field observations were evaluated in two strength models: Hoek-Brown (Hoek and Brown 2019) and Bay Area Coseismic Landslide Tool (Wade et al. 2023). Geological strength can be used to estimate the mechanical behavior of typical rock masses encountered in tunnels, slopes, and foundations. These models evaluate the probability of geotechnical conditions, including slope stability and landslide deformation. The deformation predicted for this landslide area using the Bay Area Coseismic Landslide Tool strength model is approximately 23 inches of deformation and the Hoek-Brown strength model is approximately 27 inches of deformation for the design seismic event (mean moment magnitude of approximately 7.0, USGS 2024). Based on these predictive landslide models, the Alternative C underground segment in Shepherd Canyon Road likely would be subject to deformation much greater than 2 inches. Retaining walls or other civil infrastructure would be needed along the north side of Shepherd Canyon Road and could result in removal of residences. Exploratory geotechnical data would be needed from each landslide shown on Figure 4.2-4 before detailed design could be completed. Extensive soil boring sampling would need to be done to collect the data using the same grid process described in Section 4.2.3.2. As described for Alternative B, boring sampling would require bringing heavy construction equipment, including drilling rigs, onto residential properties, grading to provide vehicle access to get the drilling rigs to the sampling locations, and extensive vegetation removal. The exploratory data would confirm whether a retaining wall is needed at each landslide location and, if so, the size of wall needed. Land use restrictions would be required for all upslope properties to avoid excess loading of the retaining walls or other load-bearing components of the underground line installation. Based on current data, it is assumed a retaining wall of unknown size would be needed along all landslides shown on Figure 4.2-4 to prevent displacement greater than 2 inches. Construction of each retaining wall would require removal of vegetation and, depending on location, excavation into the hillside.

Road Width

Saroni Drive and Shepherd Canyon Road generally are narrow roadways, which presents constraints to construction. As discussed for Alternative B, a minimum road width of 22 feet is needed to fit both double duct banks, and temporary construction areas wider than 22 feet would be needed for some construction activities.

Shepherd Canyon Road is known to contain utilities. Maps provided by the City of Oakland show that water and sewer are in the roadway; other utilities also may be present. However, utilities, including sewer and water, natural gas distribution, and telecommunication lines, are expected to be present in the roadways in unknown locations. The utilities may present additional constraints if they cannot be relocated to provide enough room for the duct banks. Where road width is not sufficient, temporary or permanent widening of the road may be required. The Montclair Railroad Trail, a paved recreational trail located along the northern side of a portion of Shepherd Canyon Road, could potentially be used if additional width were needed. The trail would require long-term closures for geotechnical investigation and then construction. Saroni Drive likely would need to be fully closed during construction activities for several weeks and Shepherd Canyon Road between Escher Drive and Oakland Fire Station No. 24 would close for up to several months; work areas within roadways typically require the width of at least two lanes and most of the roadways do not have a road shoulder.

Rationale for Carrying Forward

The Shepherd Canyon Road Underground Alternative would meet the project purpose and some of the objectives, although it would not be economical and would not minimize most of the environmental impacts associated with the proposed project. Exploratory borings and additional design may indicate that the alternative is not technically feasible. It appears to be one of the less technically constrained options for placing the lines underground through the central section. It provides a contrast to Alternative B, which has narrower and more winding roads but generally fewer landslide issues than Alternative C.

Public and Agency Comments

Community members have expressed an interest in an alternative that would underground power lines in residential areas, particularly in the central section.

4.2.3.4 Alternative E: Proposed Project with Campground Overhead Option

Description

Design and construction of this alternative would be the same as the proposed project from Moraga Substation to the two structures northwest of the Eastport Staging Area entrance of EBRPD Sibley Volcanic Regional Preserve (refer to Figure 4.2-6). The two structures would be replaced approximately 325 feet northwest of the existing locations, introducing an angle to the lines and moving the back spans farther away from a planned campground near the Eastport Staging Area entrance of EBRPD Sibley Volcanic Regional Preserve. The length of this portion of the alignment with the angle would increase the overall total 5-mile line length by approximately 100 feet. New easements would need to be acquired and the front spans would move out of PG&E property owned in fee. To maintain CPUC GO 95 compliance, vegetation management – including removal of trees – would be required within EBRPD Sibley Volcanic Regional Preserve and EBRPD Huckleberry Botanical Regional Preserve. Continuing southwest from this location, this alternative would be the same as the proposed project to Oakland X Substation. Impacts of this alternative would be similar to the proposed project.

Rationale for Carrying Forward

This alternative would meet the project purpose and objectives and appears to be feasible.

Public and Agency Comments

EBRPD agreed to this PG&E proposed option because it could reduce the visibility of the overhead lines during stargazing from the planned campground.

4.3 No Project Alternative

Section 15126.6(e) of the CEQA Guidelines requires that the No Project Alternative be considered to allow decision makers to compare the impacts of approving the proposed project against the impacts of not approving the proposed project. CEQA requires a discussion of what would be reasonably expected to occur in the foreseeable future if the project were not approved.

Under the No Project Alternative, the existing Moraga–Oakland X lines would not be replaced. Lifecycle updates of line structures would not be completed, leading to future reliability issues and potentially unsafe operations. Lifecycle updates would occur in a piecemeal fashion for years driven by ongoing inspections that identify maintenance issues, including additional aging structure replacement. NERC recommendations to the industry for clearance and wildfire risk reduction would occur with each structure replacement over an indeterminate amount of time. In addition, forecasted load growth in the project area would not be accommodated and PG&E would be unable to meet future customer demands. The No Project Alternative would not meet project objectives in the intended timeframe.

4.4 Rejected Alternatives

This section discusses all alternatives considered by PG&E that were not selected for further analysis. For each alternative, this section provides a brief description of the alternative, a description of why the alternative was rejected, and comments from the public or agencies about the alternative. Table 4.2-1 provides a discussion of the extent to which each alternative would meet project purpose and objectives, its feasibility, its potential to reduce environmental impacts of the project, and any new impacts that could occur with its implementation.

4.4.1 Alternative D: All Overhead Rebuild in Existing Alignment

4.4.1.1 Description

This alternative would replace the power lines overhead in the existing ROW for the full length of the existing alignment (refer to Figure 4.2-5). Design and construction of this alternative would be the same as the project from Moraga Substation to approximately the intersection of Park Boulevard and Estates Drive. This alternative would have similar impacts to the proposed project in this portion of the alignment. Between the Park Boulevard/Estates Drive intersection and Oakland X Substation, new overhead structures would be replaced at or adjacent to the location of the existing structures. The new conductors would be installed on the new structures. Because approximately 80 residences are located immediately below the conductors and adjacent to structures, residents may need to be temporarily relocated during construction. New ROW may need to be acquired for new structure locations. This alternative would replace approximately 5 miles of lines overhead in the existing ROW.

4.4.1.2 Rationale for Rejection

This alternative would have extensive constructability issues for the replaced structures between Park Boulevard/Estates Drive and Oakland X Substation given the immediate proximity of residences. It would have severe impacts on land use from locating replacement structures mainly on residential property with limited PG&E property owned in fee in this portion of the lines. While it is likely that replaced structures would be monopoles or lattice steel poles that have a smaller footprint to the existing towers, land use is predominantly residential structures or roadways in the western section of the project. Insufficient space is available to install replacement structures within the existing ROW without extensive modification of private properties, including potentially removing residences or impacting adjacent property owner's limited backyard space to install replacement structures. Power demands of the project's lines create limited periods when one or two circuits can be taken out of service, or deenergized to replace towers without the conductor attached to tower arms. While it is feasible to take two circuits out of service for a few weeks in the winter months, those weeks may only allow removal and replacement of one or two existing structures during each outage. Replacing approximately 15 structures over potentially 5 to 10 years of annual seasonal planned outages does not meet the project's schedule. These issues make the alternative infeasible. Therefore, this alternative was rejected.

4.4.1.3 Public and Agency Comments

No public or agency comments were made on this alternative. It was identified internally during PG&E's alternatives development.

4.4.2 Alternative F: Conceptual South Overhead Alignment

4.4.2.1 Description

The South Overhead Alignment Alternative would include construction of two new double-circuit lines, primarily overhead in a new ROW (refer to Figure 4.2-7). The new ROW would extend southwest from Moraga Substation through open space owned by EBMUD (Indian Valley Preserve Conservation Easement), EBRPD (Reinhardt Redwood Regional Park), and the City of Oakland (Joaquin Miller Park) and cross over SR 13/Hayward Fault. The Hayward Fault crosses Lincoln Avenue southwest of its intersection with Monterey Boulevard. The lines would remain overhead until they cross the Hayward Fault and only then transition below ground at an undetermined location west of SR 13 near Lincoln Avenue outside of the fault zone. The underground portion would be within Lincoln Avenue southwest to MacArthur Boulevard before continuing northwest into Excelsior Avenue and, finally, turning northeast on Kingsley Street and Park Boulevard Way to Oakland X Substation. This alignment would be a minimum of approximately 6 miles long, with approximately 3.5 miles of the 6 miles being overhead lines.

The existing four circuits of the Moraga–Oakland X 115 kV Line would be removed, including conductors and structures, using similar construction activities as the project. Construction of the underground portion of the alternative would entail similar activities as the project, for a greater length. Modifications of Moraga and Oakland X substations for this alternative would be similar to the project.

Construction of the new overhead lines portion would require acquisition of at least approximately 3.5 miles of new approximately 150- to 200-foot-wide ROW. New temporary and permanent access roads would be required for construction and operation. Trees and shrubs would be removed from the ROW. New lattice steel towers, lattice steel poles, and tubular steel poles would be constructed using similar construction methods as the proposed project. Construction would likely be completed with the use of helicopters over open space and parkland. Construction staging areas, including helicopter landing sites and pull sites, were not identified, but likely would be located within open space areas.

4.4.2.2 Rationale for Rejection

This alternative likely would not be legally feasible based on the need to acquire new ROW through CEs. In addition, it likely would have significant impacts to biological resources and aesthetics resulting from construction of new lines and ROW in an undeveloped area. Therefore, this alternative was rejected.

4.4.2.3 Public and Agency Comments

No public or agency comments were made on this alternative. It was identified internally during PG&E's alternatives development.

4.4.3 Alternative G: Distribution Energy Resources

4.4.3.1 Description

This alternative would implement improvements to reduce electrical system demand through distributed energy generation to the degree that the Moraga–Oakland X power lines are not needed. As discussed in Chapter 2, the structures are aging and the entire Moraga–Oakland X path requires replacement for safe operation of the lines. If it is not rebuilt, the Moraga–Oakland X path would require removal. If this alternative were to be done in lieu of the proposed project, it would need to replace at a minimum the energy demand at Oakland X Substation provided by the four 115 kV circuits with distribution energy resources. As discussed in Chapter 2, the forecasted demand at Oakland X Substation is approximately 43.31 MW for 2024 and approximately 103.1 MW in 2039.

A high-level review of this alternative assumed that the new load would be served using a solar and battery solution over a 24-hour period without weather or seasonal variation and with worst case energy consumption. The new power generation (solar and battery) was assumed to be 100 percent renewable to inform the solar photovoltaic (PV) direct current system size. The power generated by the solar PV system would be stored in a battery that would maintain service of the load when the solar PV system was not generating (lack of sunlight).

To replace the approximately 43.31 MW load, a round number of 50 MW is used for this discussion. To provide a 50 MW constant load, the battery plant size is calculated by multiplying the load (50 MW) times the hours per day (24 hours). A 1.2 gigawatt hour (GWh) battery plant would be required to deliver 50 MW of constant load 24 hours per day.

Battery design generally sizes a battery with an assumed 20 percent degradation over 10 years. Using that progressive degradation, the initial battery plant would be sized to yield a 1.5 GWh battery plant on day 1 (1.2 GWh divided by 80 percent). PG&E would build in additional battery capacity to account for weather events such as extended storms with a conservatively sized 2 GWh battery power plant. Each 250 MW, 1 GWh Tesla Megapack requires 3 acres, and to store energy for the 50 MW load, two Megapacks, or 6 acres, of total battery plant would be needed (The Tesla Team 2019). Assuming the battery can only be charged by solar, and it cannot be charged from an electrical grid or from onsite diesel generation, then the solar PV plant would need to be capable of charging that battery completely during the day. The worst-case scenario would be wintertime charging, which offers (conservatively) only 2 solar hours per day, which would mean the solar PV direct current plant would need to be approximately 750 MW to charge the 2 GWh batteries. Typically, PG&E has found that 1 MW of solar PV requires approximately 6.89 acres of flat land. The solar PV plant would require approximately 5,167 acres (approximately 8 square miles) of solar fields to replace the load provided by the existing project power lines. The 500 MW, 2 GWh battery power plant would be an additional 6 acres. In addition, battery power plants typically are connected to a nonrenewable fuel source such as natural gas or a diesel plant to support load delivery when solar panels are blocked from receiving the solar energy during weather events such as extended storms. If the system was designed for the 2039 load forecast estimated at 103.1 MW, then the values could be doubled for an approximate estimate. Refer to Section 4.4.4 for additional discussion on energy storage.

4.4.3.2 Rationale for Rejection

Load relief has to be instantaneous and dependable, and the required amount would depend on the operating condition. Solar generation is time and weather limited. The Moraga–Oakland X power lines delivers power to two utilities (Port of Oakland and City of Alameda) that are not subject to CPUC jurisdiction. Therefore, the replacement of an approximately 43.31 MW demand at Oakland X Substation by distribution energy resources primarily would need to happen in the City of Oakland. As previously noted, this would require approximately 5,173 acres of solar fields and battery storage primarily within the City of Oakland. Vacant land of this size likely does not exist in Oakland. For example, the Oakland Coliseum property, perhaps the largest undeveloped site in Oakland, is approximately 112 acres (City of Oakland 2024). If the entire site were converted to solar generation, it would provide approximately 2 percent of the area required. To replace the current demand, a solar PV and battery plant would require flat areas approximately 46 times the size of the Oakland Coliseum Complex. In addition, the needed area for solar fields would have to more than double to meet demand in 2039. Relying on rooftop solar to meet the 43.31 MW demand is not feasible either. Approximately 42 million kWh of power is generated each year in Oakland through rooftop solar (SunPower n.d.), a level that took years to achieve, occurs only when the sun is shining, and represents only a fraction of the existing demand. Providing an additional 43.31 MW of power would take many years to generate though rooftop solar, long after the existing lines would require replacement. For these reasons, this alternative is largely infeasible.

PG&E did not perform a detailed analysis of a distribution energy resources alternative because it was determined that it would not meet the project's basic purpose and objectives. It is not technically feasible to reduce electrical system demand sufficiently to eliminate the need for the Moraga–Oakland X path. The existing facilities cannot be retained because the structures are aging, and the entire path requires replacement for safe operation of the lines.

4.4.3.3 Public and Agency Comments

No public or agency comments were made on this alternative. It was included for consistency with CPUC *Guidelines for Energy Project Applications Requiring CEQA Compliance*.

4.4.4 Alternative H: Energy Storage

4.4.4.1 Description

This alternative would implement improvements to provide sufficient energy storage in the project area that the Moraga–Oakland X path would not be needed. As discussed in Chapter 2, the structures are aging and the entire Moraga–Oakland X path requires replacement for safe operation of the lines. If it is not rebuilt, the Moraga–Oakland X path would require removal. If this alternative were to be done in lieu of the proposed project, it would need to store energy within the East Bay to accommodate the increasing forecast demand of approximately 103.1 MW at Oakland X Substation in 2039. To supply approximately 100 MW, the load is multiplied by 24 hours and calculates the need for a 2.4 GWh battery plant. This would require approximately 9 acres for battery energy storage facilities, assuming Tesla Megapack technology of 3 GWh at 250 MW is required. The battery storage facility would need to be connected to a power source that could replenish the battery on a continual basis.

4.4.4.2 Rationale for Rejection

The Moraga–Oakland X path delivers power to two utilities (Port of Oakland and City of Alameda) that are not subject to CPUC jurisdiction. The energy storage would, therefore, need to happen in the City of Oakland. As discussed in Section 4.4.3, the City of Oakland may have sufficient vacant land to accommodate 9 acres of Tesla Megapack battery energy storage power plant and generation facilities, but it requires a source of energy to charge the batteries. Energy would have to be delivered to the energy storage through new power lines if not generated, which could have impacts at least comparable to the proposed project, or through distribution energy resources, for which sufficient vacant land likely is not available (refer to Section 4.4.3).

PG&E did not perform a detailed analysis of an energy storage alternative because it was determined that it would not meet the project's basic purpose and objectives. It is not technically feasible to provide sufficient energy storage in a densely developed urban area to eliminate the need for the Moraga–Oakland X path. The existing lines would require replacement long before the needed level of energy storage and supporting energy delivery could be constructed.

4.4.4.3 Public and Agency Comments

No public or agency comments were made on this alternative. It was included for consistency with CPUC *Guidelines for Energy Project Applications Requiring CEQA Compliance*.

5. Environmental Analysis

The following sections provide an assessment of environmental impacts anticipated from construction, operation, and maintenance of the Moraga–Oakland X 115 kV Rebuild Project (project). The environmental impacts are evaluated for the following resource areas, consistent with the requirements of CEQA:

1. Aesthetics
2. Agriculture and Forestry Resources
3. Air Quality
4. Biological Resources
5. Cultural Resources
6. Energy
7. Geology, Soils, and Paleontological Resources
8. Greenhouse Gas Emissions
9. Hazards, Hazardous Materials, and Public Safety
10. Hydrology and Water Quality
11. Land Use and Planning
12. Mineral Resources
13. Noise
14. Population and Housing
15. Public Services
16. Recreation
17. Transportation
18. Tribal Cultural Resources
19. Utilities and Service Systems
20. Wildfire
21. Mandatory Findings of Significance

Sections 5.1 through 5.21 present the environmental impact analysis for each resource area evaluated for the project. A checklist is provided in each section to summarize the anticipated level of impact (for example, No Impact, Less Than Significant Impact, Less Than Significant Impact with Mitigation Incorporated, and Potentially Significant Impact) to each resource area, according to CEQA significance criteria. Each section addresses analysis methodology and environmental setting, applicable regulations, impact questions, APMs, and potential impacts.

With respect to PG&E, because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, PG&E is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies (CUPAs) with respect air quality and hazardous waste regulations. A summary of local standards and ordinances pertaining to the resources within the project area is provided for informational purposes and to assist with the CEQA review process in each section.

The analysis concludes that all impacts will be less than significant. The implementation of APMs will further avoid or minimize impacts on environmental resources, ensuring that any remaining impacts will be less than significant.

5.1 Aesthetics

This section describes existing conditions and potential impacts on aesthetics/visual resources as a result of construction, operation, and maintenance of the project. The analysis concludes that impacts on aesthetic resources will be less than significant; the APMs described in Section 5.1.4.2 will further reduce the project’s less-than-significant impacts on aesthetic resources. The project’s potential effects on aesthetic resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.1-2 and discussed in more detail in Section 5.1.4.

5.1.1 Methodology and Environmental Setting

The visual analysis is based on review of technical data, including project maps and drawings provided by PG&E, aerial and ground-level photographs of the project area, local planning documents, and computer-generated visual simulations. Field observations were conducted in September, October, and November 2023, and July and September 2024 to document existing visual conditions in the project area and to identify potentially affected sensitive viewing locations.

This visual study employs assessment methods based, in part, on guidance from the Federal Highway Administration (FHWA) and other accepted visual analysis techniques. This study also addresses the CEQA Guidelines for visual impact analysis. Systematic documentation of the visual setting and an evaluation of visual changes associated with the project are provided. To convey a sense of existing visual conditions, photographs are included that show representative public views of the project area.

Consistent with FHWA methods, this impact analysis describes change to existing visual resources and assesses viewer response to that change. A set of 24 representative viewpoints selected to convey a general sense of the existing visual character of the landscape within the vicinity of the project is summarized in Table 5.1-1 and illustrated with a set of photographs presented on Figure 5.1-2. Fifteen Key Observation Points (KOPs) were selected to represent viewing locations where the project could be most visible to the public, including an open space recreation trail and group campsite, a county scenic route, residential neighborhoods near project elements, a well-traveled public roadway near residences, a school, and a church. Using technical methods described in the following section, visual simulations were prepared to show the project from these KOPs and to document the visual change that will occur.

Central to this assessment is an evaluation of representative views from which the project will be visible to the public. Fifteen KOPs have been selected to represent viewing locations where the project could be most visible to the public. To document the visual change that will occur, visual simulations, presented as before-and-after images, show the project from these KOPs. The visual simulations presented on Figures 5.1-3a through 5.1-17b document the project-related visual changes that will occur at the 15 KOPs and provide the basis for evaluating potential visual effects associated with the project from these key public views. The methodology employed for preparing the simulations includes site photography, computer modeling, and digital rendering techniques.

Photographs were taken using a full-frame digital camera with standard 50-millimeter lens, which represents an approximately 40-degree horizontal view angle. Photography viewpoint locations were documented systematically using photo log sheet notation, global positioning system (GPS) recording, and base-map annotation. Digital aerial photographs and project design information supplied by PG&E provided the basis for developing a three-dimensional computer model of the new project components. For each viewpoint simulation, viewer location was input from GPS data using 5.5 feet as the assumed eye-level height. Computer “wireframe” perspective plots were overlaid on the simulation photographs to verify scale and viewpoint location. Digital visual simulation images then were produced based on computer renderings of the three-dimensional model combined with the selected digital site photographs. The simulations are presented as figures with two full-page images designated “a” and “b,” with the existing views shown on the “a” figures and the post-project visual simulations shown on the “b” figures.

Section 5.1.3.4 includes additional description of methods employed for evaluating visual change. The visual impact assessment is based on evaluation of the changes to the existing visual resources that will result from construction and operation of the project. These changes were assessed, in part, by evaluating the KOP after views provided by the computer-generated visual simulations and comparing them to the existing visual environment.

5.1.1.1 Landscape Setting

The project is in Northern California's metropolitan San Francisco Bay Area, within a densely populated urban corridor approximately 6 to 8 miles wide by 45 miles long, along the east of San Francisco Bay. Figure 5.1-1a shows the project location within a regional and local landscape context. This area extends south from San Pablo Bay to Santa Clara Valley to the south, and generally is bounded on the west by flat, estuary-fringed bay shore. To the east, a continuous backdrop of undulating, open grass and woodland greenbelts of the East Bay Hills rises abruptly from the gently inclined coastal plain. Typical regional land uses, including commercial, industrial, residential, and recreational open space, are found within the broader bay plain and East Bay Hills area; however, the predominant land use in the immediate project area is residential, interspersed with recreational open space preserves in addition to limited areas of institutional and commercial use as well as the existing power line corridor.

The project alignment is approximately 5 miles in length and originates in a suburban setting approximately 2 miles southwest of the central City of Orinda. The route generally travels southwest, passing through EBMUD watershed land and EBRPD land before crossing the summit of the Oakland/Berkeley Hills and entering the City of Oakland (Oakland). In Oakland, the route traverses hillside residential communities and two urban creek watershed preserves before terminating at Oakland X Substation approximately 2.25 miles east of downtown Oakland. Rising to approximately 1,370 feet above sea level at the Oakland/Berkeley Hills summit, the elevation at Moraga Substation in the Lamorinda Valley on the east is approximately 650 feet above sea level and the elevation at Oakland X Substation, the western project terminus, is approximately 140 feet above sea level. Vegetation patterns within the project area reflect marked microclimate variations that occur between generally cooler bayshore areas and the more-arid inland climate found east of the hills. The west-facing Oakland/Berkeley Hills support relatively dense stands of mature trees consisting of a mixture of native oaks, redwood, and non-native eucalyptus and pines, while the drier east flank of the hills supports more-sparse, savannah-like vegetation, dominated by open grassland and more widely dispersed stands of native oaks.

As shown on Figure 5.1-1a, the Project alignment crosses several key transportation corridors connecting to adjacent East Bay communities; among these are Skyline Boulevard, a county scenic route that extends along the summit of the East Bay Hills from the Oakland/Berkeley border to the southern border of Oakland, and the Warren Freeway (State Route [SR] 13), a north-south connector, linking SR 24 and Interstate 580 (I-580), important regional highway corridors situated northwest and southeast of the project area, respectively. The project largely parallels and crosses Shepherd Canyon Road, an east-west arterial that extends from the summit of the Oakland Hills to the nearby commercial district of Montclair, situated adjacent to the Warren Freeway, and provides access to residential neighborhoods within the project area between the Warren Freeway and Skyline Boulevard. The project overhead power lines also cross, and the project underground portion continues within, Park Boulevard, an urban arterial that connects the Warren Freeway and Oakland's central business district, as well as connecting to the broader regional transport network via I-580 and the MacArthur Boulevard interchange. In addition to infrastructure associated with these major roadways, established landscape features within the project area include a grid of local paved streets and electric utility infrastructure that includes numerous distribution and telecommunication lines.

Landscape character along the immediate project route varies from largely undeveloped open space preserves, including regional and local park land, to predominantly single-family residential neighborhoods, ranging from dispersed residences within the densely wooded hillsides above the Warren Freeway located north of Shepherd Canyon to more densely clustered urban lots with manicured landscaping in the area immediately north of Park Boulevard.

5.1.1.2 Scenic Resources

Scenic resources are those natural and built landscape patterns and features that are considered visually or aesthetically pleasing and, therefore, contribute positively to the definition of a distinct community or region. Scenic resources may include trees or other important vegetation; landform elements, such as hills or mountains, ridgelines, or rock outcroppings; water features, such as rivers, bays, or reservoirs; and landmarks, important buildings, or historic sites and structures.

As described in Section 5.1.1.4, the East Bay Hills ridgelines and tributary canyons constitute important scenic resources within the project vicinity. These include the largely undeveloped greenbelt east of the Oakland/Berkeley Hills summit under the jurisdiction of EBRPD, and include Tilden Park to the north, Sibley Volcanic Regional Preserve and Huckleberry Botanic Regional Preserve in the immediate Project area, and Redwood Regional Park to the south. Incorporating 125,496 acres of parkland that extends from San Pablo Bay to the north to the southern Alameda County line to the south, these areas afford visitors a range of scenic and recreation amenities. Among these are approximately 1,330 miles of hiking and equestrian trails, including the East Bay Skyline Trail, a 31-mile continuous path that passes through six of the East Bay regional parks and preserves, and is crossed by the project (EBRPD 2023). A designated National Recreation Trail, this trail is overlain with segments of the Bay Area Ridge Trail, a planned 550-mile multi-use trail along ridgelines ringing the San Francisco Bay Area. The trail affords users panoramic city and bay views, passing historic and geologic resources and the largest remaining natural stand of coast redwoods found in the East Bay. Views from Sibley Volcanic Regional Preserve and Huckleberry Botanic Regional Preserve are included in the set of representative photographs, Figure 5.1-2, Photographs 2, 3 and 4. A set of visual simulations of the proposed project are presented on Figures 5.1-3, 5.1-4, and 5.1-5, with analysis of visual change and potential impacts discussed on Section 5.1.4.3.

Numerous historic landscape features of scenic and recreational importance in the vicinity of the project are found in the canyons west of the Oakland/Berkeley Hills summit. A former logging railway ROW in lower Shepherd Canyon has been converted to a pedestrian greenway known as the Montclair Railroad Trail that constitutes a popular recreation amenity for residents; an approximately 0.7-mile-long portion of the project construction area is located along the trail. A view from this trail is shown on Figure 5.1-2, Photograph 7, and a visual simulation is presented on Figure 5.1-10, with analysis of visual change and potential impacts discussed in Section 5.1.4. Similarly, the Bridgeview Trail that follows Dimond Canyon west of the Warren Freeway parallels and then is crossed by the project, affording visitors dramatic views of the historic Leimert Bridge, at one time the largest single-span bridge in the western U.S. Views from the Bridgeview Trail and Leimert Bridge are included on Figure 5.1-2, Photographs 11 and 14. Other historic structures in the area include remnants of a Mexican-era cottage in Dimond Park southeast of the Project, as well as Woodminster Amphitheater, a Works Progress Administration project of recognized historic importance found in Joaquin Miller Park, approximately 1.4 miles southeast of the project alignment.

Various public roadways are recognized for providing access to scenic resources in the project vicinity. I-580, a designated state scenic highway, passes approximately 700 feet west of Oakland X Substation. The Warren Freeway (SR 13) and Park Boulevard are designated Alameda County scenic routes that are crossed by the project approximately midway along its route. These relatively heavily traveled corridors afford vehicular access to other county scenic routes within or adjacent to the Project area. Views from SR 13 are included on Figure 5.1-2, Photographs 9 and 10, and a visual simulation is presented on Figure 5.1-13. Views from Park Boulevard are included on Figure 5.1-2, Photographs 13, 13b, and 15, and a visual simulation is presented on Figure 5.1-14. As discussed in Section 5.1.4, views of the project from both SR 13 and Park Boulevard tend to be brief in duration and limited by topography and dense vegetation.

Skyline Boulevard is an Alameda County scenic route crossed by the project that begins near the Warren Freeway-Highway 24 junction north of the project area and extends approximately 7 miles to the junction with Joaquin Miller Road, approximately 1.25 miles south of the project alignment. Closely paralleling the summit of the Oakland/Berkeley Hills, this roadway offers motorists and bicyclists numerous informal views toward San Francisco Bay, the Golden Gate Bridge, and adjacent peninsulas and peaks to the west. To the east, it affords views of the 3,800-foot-high Mount Diablo, a major regional topographic feature. A view from Skyline Boulevard is shown on Figure 5.1-2, Photograph 5, and a visual simulation is presented on Figure 5.1-7, with analysis of visual change and potential impacts discussed in Section 5.1.4. As noted in Section 5.1.4, views of the project from Skyline Boulevard tend to be brief in duration and limited by dense vegetation.

5.1.1.3 Viewshed Analysis

A 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 foreground, middleground, and background zones. The foreground is defined as the zone within 0.25 mile to 0.5 mile of the viewer; the middleground is defined as the zone that extends from the foreground to a maximum of 3 to 5 miles from the viewer; and the background zone extends from the middleground to infinity (U.S. Department of Transportation 2015). Viewing distance is a key factor that affects the potential degree of project visibility. Visual details generally become apparent to the viewer when they are observed in the foreground, at 0.25 mile to 0.5 mile or less.

Figure 5.1-1b shows the potential visibility of PG&E project elements from up to 2 miles away from the project corridor. A delineation of the area within 0.5 mile from the project also is shown. Because of the hilly terrain and landscape screening in the project area, a maximum distance of 2 miles was used for the analysis. Intervening topography, vegetation, and to a somewhat lesser degree built structures, limit visibility of project components to between a few hundred feet and approximately a quarter mile along much of the project route. Figure 5.1-1b shows limited or no project visibility from most of the project surroundings up to 2 miles away.

As illustrated on Figure 5.1-2 and representative photographs, structures along the alignment are only partially visible in most cases and from any one location where the project can be seen, views are in many cases limited to a single pair of structures. Only a few locations afford open (public) views of multiple project structures. Among these are a segment of recreation trail within the Sibley Volcanic Regional Preserve, where there are relatively unobstructed views toward several lattice towers along the project alignment as it passes through grass covered, undulating terrain (Photographs 2 and 3). Multiple structures also can be seen from a residential intersection below Skyline Boulevard (Photograph 6).

Residences in the heavily forested and steep terrain in the project area between the Oakland Hills summit and SR 13 are typically set back from area roadways and from each other in this low-density neighborhood, and surrounding mature vegetation largely screens views toward the structures. Public views of the project structures west of SR 13 are blocked not only by intervening vegetation and the undulating topography through which the project passes, but also constrained by numerous closely spaced residential structures and adjacent roadside infrastructure such as signage, traffic lights, light poles, and non-project electrical utility structures.

Open views of the project alignment along this portion of the route generally are limited to the view from Leimert Bridge and a point on Park Boulevard (Photographs 13b and 14), as well as along isolated segments of Trestle Glen Road, as shown on Photographs 14 and 18, respectively, and discussed in Section 5.1.1.4. Project visibility from most major traffic corridors in the project area, including Skyline Boulevard, Shepherd Canyon Road, SR 13, and Park Boulevard, is constrained by intervening topography and dense vegetation and project structures generally are not visible except where the alignment crosses these corridors. Where potentially visible from more distant locations, such as the heavily traveled I-880 corridor, situated almost 2 miles away, the project will not be evident to the casual observer. Accordingly, the primary focus of the visual analysis is the foreground viewshed zone, where project-related visual effects will be most apparent, particularly those areas within 0.5 mile of project elements.

5.1.1.4 Landscape Units

For purposes of documenting and describing the project's foreground viewshed, three subareas or landscape units with distinguishing land use and development patterns have been identified and are shown on Figure 5.1-1a. The East Landscape Unit encompasses the eastern segment of the project area, extending approximately 1.7 miles west from the PG&E Moraga Substation in Contra Costa County to Manzanita Drive at the ridgeline of the East Bay Hills and the Alameda County line. The landscape includes undulating open grassland, scattered oak woodlands, and hillside ridgelines. The area is primarily undeveloped land and open space, including the Sibley Volcanic Regional Preserve and Huckleberry Botanic Regional Preserve, and is crossed by the East Bay Skyline Trail. Photographs 1 through 3b on Figures 5.1-2a and 5.1-2b show representative views of the project and surrounding landscape character found within the East Landscape Unit. Three of these views are KOPs selected for visual simulation to show the project as seen from trails in the Sibley Volcanic Regional Preserve.

The Central Landscape Unit extends approximately 2.25 miles in a generally southwesterly direction from Manzanita Drive to Park Boulevard at Estates Drive. Compared with the East Landscape Unit, this area is characterized by hillside residences along narrow winding streets and undulating to steep wooded terrain, including Shepherd and Dimond Canyons. Public open space within this area includes Shepherd Canyon Park, the Montclair Railroad Trail, and the Bridgeview Trail in Dimond Canyon Park. The historic Leimert Bridge provides open views of Dimond Canyon and the wooded hillsides. The project crosses Alameda County scenic routes within this section, including Skyline Boulevard, Shepherd Canyon Road, Warren Freeway, and Park Boulevard. Photographs 4 through 14 on Figures 5.1-2c through 5.1-2i show representative views of the project and surrounding landscape character found within this Landscape Unit. Nine of these views are KOPs selected for visual simulations to show the project as seen from sensitive locations.

The West Landscape Unit extends 1.15 miles from Park Boulevard at Estates Drive to Oakland X Substation. The landscape unit includes gently undulating, developed terrain with primarily residential development with mixed commercial businesses. The area immediately north of Park Boulevard includes densely clustered urban lots with ornamental landscaping and the somewhat enclosed Trestle Glen neighborhood. This landscape unit contains a higher concentration of built infrastructure, including more noticeable utility infrastructure such as light poles, traffic signals, electrical utility poles, and distribution lines. Representative views of this landscape unit are illustrated in Photographs 15 through 20 on Figures 5.1-2i through 5.1-2l and include a KOP selected for a visual simulation of the proposed riser structures and two KOPs showing proposed structure removal.

5.1.1.5 Viewers and Viewer Sensitivity

Accepted visual assessment methods, including those adopted by the FHWA, establish sensitivity levels as a measure of public concern for changes to scenic quality. Viewer sensitivity, one of the criteria for evaluating visual impact significance, can be divided into high, moderate, and low categories. Factors considered in assigning a sensitivity level include viewer activity, view duration, viewing distance, adjacent land use, and special management or planning designation. According to the FHWA's *Visual Impact Assessment for Highway Projects* (FHWA 2015), research on the subject suggests that certain activities tend to heighten viewer awareness of visual and scenic resources, while others tend to be distracting. The project viewshed includes several types of concerned viewer groups, primarily nearby residents, recreational users of project area open space, and motorists on area roadways that cross the project alignment.

Motorists traveling on local arterial and other public roadways located relatively close to or crossing the project alignment represent the largest group of potentially affected viewers. Traffic volume varies on these roads, ranging from the heavily traveled, four-lane SR 13/Warren Freeway and major arterials, including Park Boulevard and Shepherd Canyon Road, to less-traveled local streets such as Trestle Glen Road. The project overhead alignment generally does not parallel public roadways, except for approximately 0.9 mile where the alignment comes within 500 feet of Shepherd Canyon Road, and along Trestle Glen Road northeast of Oakland X Substation. At roadway crossings, motorists' views toward the project alignment generally are screened by intervening elements such as vegetation and topography; however, there is a relatively open view toward the project overhead crossing of Park Boulevard. The project underground segment will be constructed within Park Boulevard. Motorists consist mainly of local travelers, including commuting workers, who are familiar with the visual setting, along with a smaller number of regional travelers using the roads less regularly. Roadway views generally are brief in duration and the sensitivity of this viewer group is considered low to moderate.

A second viewer group consists of residents who live near to, or directly alongside, the project corridor. Included in this viewer group are a limited number of viewers inhabiting a residential subdivision located adjacent to Moraga Substation, scattered locations near the summit of the Oakland Hills and immediately north of Shepherd Canyon, as well as an area above the Warren Freeway. In addition, residential views of the project alignment are available to inhabitants of the residential neighborhoods below the Warren Freeway, south of the project alignment along Leimert Boulevard, and immediately north of Park Boulevard, including locations along Trestle Glen Road. There are approximately 2,096 residences located within 1,000 feet of proposed project structures. For many residents near the alignment at these locations, particularly residents in the Oakland Hills neighborhoods above the Warren Freeway, mature vegetation and topography provide a measure of screening. Residential views tend to be long in duration, and the sensitivity of this viewer group is considered moderate to high.

Recreational viewers at public open space, trails, and other recreation facilities found within the project vicinity constitute another potentially affected viewer group. These may include users of local open space preserves that lie near (including at lower and higher elevations than) the project alignment, such as Dimond Canyon Park, where open views of project towers are available along the ridges overlooking the canyon, and Shepherd Canyon Park, where project structures are partially visible at relatively close range. In addition, pedestrians, bicyclists, and equestrians access recreation trails, including the East Bay Skyline National Recreation Trail and McCosker Loop Trail, that cross the project alignment within Sibley Volcanic Regional Preserve and Huckleberry Botanic Regional Preserve east of the Oakland Hills. Recreational viewers also include visitors to the planned group camping and interpretive site in Sibley Volcanic Regional Preserve. Because of the comparatively sparse vegetation in this area, open, relatively unobstructed views of the alignment generally are available to recreational users. Duration of views for pedestrians, bicyclists, and other recreational viewers may range from several minutes at any one location, lasting up to several hours in the case of park users and visitors to open space preserves. The sensitivity of this viewer group is considered moderate to high.

An additional viewer group includes students, church attendees, and staff at Corpus Christi School and Church located on Park Boulevard at Estates Drive. Views tend to be brief or moderate in duration and the sensitivity of these viewers is considered moderate to high.

5.1.1.6 Representative Viewpoints

Twenty-four representative viewpoints have been identified for the project. Table 5.1-1, a summary of this set of representative viewpoints and photographs, includes information on the viewpoint location, primary type of viewers, approximate viewing distance to the project, and a description of the existing visual conditions. In addition, the table also highlights a subset of the photographs that are KOPs selected for visual simulations. Figures 5.1-2a through 5.1-2l include 12 sheets showing a photograph taken from each of the viewpoints. Taken together, these photographs convey a general sense of the existing visual character of the landscape within the vicinity of the project.

Table 5.1-1. Summary of Representative Viewpoints and Photographs

Viewpoint Number, Location, and Viewing Direction[a]	Primary Viewers	Approximate Viewing Distance to Project	Existing Visual Conditions
East Landscape Unit			
1. Snow Court in Moraga looking southwest	Residents	870 feet	This is a view from Snow Court, a nearby residential cul-de-sac at the southwestern edge of Orinda. The viewpoint is located near where the alignment crosses a ridge. Beyond grassland and a dense stand of trees seen in the foreground, the upper portions of three lattice towers are visible against the sky. At this location, intervening topography and vegetation both screen lower portions of the project structures.
2. McCosker Loop Trail in Robert Sibley Volcanic Regional Preserve looking northeast[a]	Recreationalists	750 feet	In this view from McCosker Loop Trail in Sibley Volcanic Regional Preserve, undulating grass and tree-covered terrain is in the foreground, and two lattice towers and wood poles are silhouetted against the sky where the alignment crests a nearby ridgetop.
3. East Bay Skyline Trail* (Bay Area Ridge Trail) looking northeast	Recreationalists	1,260 feet	This view is from a higher elevation along the East Bay Skyline Trail (Bay Area Ridge Trail) that crosses the alignment. In this view from near the western boundary of the regional park, multiple pairs of project towers and overhead conductors can be seen against a backdrop of scattered oak woodland and undulating grass-covered terrain. In the distance, several lattice towers are barely discernible against the light sky backdrop.
3b. East Bay Skyline TrailBay Area Ridge Trail) looking southwest	Recreationalists	485 feet	This is a view of the project from approximately the same location along the East Bay Skyline Trail (Bay Area Ridge Trail) shown in KOP 3, looking uphill to the southwest along the project ROW toward where the alignment crests the Oakland/Berkley Hills summit at Manzanita Drive. From this perspective, dense vegetation above the trail in the immediate foreground gives way to an unobstructed, relatively close-range view of a pair of project lattice towers, along with an adjacent wood utility pole, silhouetted against a sky backdrop.
Central Landscape Unit			
4. Manzanita Drive near The Hills Swim and Tennis Club looking west[a]	▪ Local Motorists ▪ Residents ▪ Recreationalists	240 feet	This is a view looking west along Manzanita Drive, a residential street at the Oakland/Berkeley Hills summit. Located near a residence and a private athletic club, this view shows a mixture of mature tree canopy in the foreground and a pair of prominent project power line structures silhouetted against the sky, with overhead conductors angling sharply downhill to the left. Additional built elements in the foreground include a part of a single story residence on the left, a steel cobra head light pole along the street, driveways and a parking area on the right for the nearby athletic club, and access to the Huckleberry Botanic Regional Preserve, which borders the east side of this street.

Table 5.1-1. Summary of Representative Viewpoints and Photographs

Viewpoint Number, Location, and Viewing Direction[a]	Primary Viewers	Approximate Viewing Distance to Project	Existing Visual Conditions
5. Skyline Boulevard looking west[a]	▪ Local and regional motorists ▪ Residents ▪ Recreationalists	240 feet	This is a motorist's view from along Skyline Boulevard, an Alameda County scenic route where the project crosses this well-traveled summit roadway. The upper portion of a project lattice pole can be seen near the center of this view, just beyond the roadway edge, and to its left a wood utility pole supports overhead electrical and telecommunication lines. Beyond dense trees seen in the immediate foreground, a metal guardrail borders the left side of roadway, and several residential driveways also are visible on the left. Dense mature trees characteristic of this hillside area also are visible in the distance beyond the curve in the roadway. Partially visible on the right, a steel lattice project tower is seen against a backdrop of dense vegetation near the top of the steep roadside embankment.
6. Balboa Drive at West Circle looking northeast[a]	▪ Local and regional motorists ▪ Residents ▪ Recreationalists	280 feet	This view is looking northeast from Balboa Drive, a narrow hillside road that provides access to a group of residences situated on the hill approximately 500 feet above Shepherd Canyon Road. In the center of this view, a retaining wall, riprap, slope contouring, and vegetation removal reflects a comparatively recent repair to the slope above the road. The removal of mature trees combined with slope recontouring results in a relatively unobstructed view toward the project alignment, including multiple pairs of lattice towers and overhead conductors seen primarily silhouetted against the sky receding toward the distant summit. To the right in the immediate foreground are several residences that overlook Shepherd Canyon, adjacent to which is a dense stand of mature vegetation, and a wood utility pole supporting power lines and telecommunication cable, partially screened by vegetation, can be seen near the center.
6b. Thackeray Drive at Westover Drive looking northwest[a]	▪ Local motorists ▪ Residents	940 feet	In this view looking northwest from Thackery Drive, a more distant view of the project is afforded residents across Shepherd Canyon. Surrounded by mature landscaping, parts of several residences located along the edge of the north-facing slope of Shepherd Canyon are visible in the foreground, along with a wood utility pole supporting multiple overhead power and telecommunication lines, prominently visible on the right. On the opposite side of the canyon, visible on the left in the middle distance, a pair of light-colored project lattice structures stand out against the dominant backdrop of the dark, mature tree canopy beyond. In the center of the view, beyond the garage roof in the foreground, a single project lattice structure can be seen partially backdropped by a residential structure and distant tree canopy.
7. Montclair Railroad Trail in Shepherd Canyon Park looking north	Recreationalists	440 feet	This view is looking north from Montclair Railroad Trail, a recreation trail within Shepherd Canyon Park, a public open space that parallels the north side of Shepherd Canyon. At this trail location near the west end of the park, the upper portion of a pair of new Corten steel monopoles can be seen silhouetted against the sky beyond dense tree canopy. The paved multi-use trail, a trail sign, and bench are seen in the foreground.
8. Drake Drive at Rincon Drive looking south[a]	▪ Local motorists ▪ Residents	400 feet	This view looking south from Drake Drive is near a group of hillside residences immediately above Shepherd Canyon Park, where a mix of tall trees and dense lower vegetation surround residential properties framing the foreground view. Seen near the center, a pair of steel lattice towers are primarily silhouetted against the sky, while limited lower portions are visible against a backdrop of distant trees. In the foreground are a prominent wood utility pole supporting power and telecommunication lines and a cobra-head streetlight along with wood fencing, a parked vehicle, and wood fencing on the right.

Table 5.1-1. Summary of Representative Viewpoints and Photographs

Viewpoint Number, Location, and Viewing Direction[a]	Primary Viewers	Approximate Viewing Distance to Project	Existing Visual Conditions
8b. Drake Drive at Magellan rive looking northeast	▪ Local motorists ▪ Residents	210 feet	This is a view looking northeast a short distance south of the Drake Drive/Rincon Drive intersection, KOP 8 viewpoint. A residential property with an attached garage and elevated deck facing Drake Drive can be seen in the left center of the view in the foreground. A pair of existing project LSPs supporting numerous overhead conductors are partially visible directly behind the residence, beyond which is a stand of mature trees. In the immediate foreground is a prominent wood utility pole supporting numerous power and telecommunication lines, along with a parked vehicle and street sign marking the roadway intersection.
9. State Route 13 (Warren Freeway) looking north	Local and regional motorists	560 feet	In this motorist view looking north from the edge of SR 13, an Alameda County scenic route, a pair of project lattice towers are silhouetted against the sky and distant trees above the open hillside along the roadway. A steel cobra head light pole is prominent in the foreground next to the highway and additional steel poles are seen beyond. Dense tree cover and understory vegetation generally screen views of the project from the freeway. This fleeting view is limited to the small section of the freeway where the project crosses and the four-lane freeway corridor provides a more open view of the alignment.
10. State Route 13 (Warren Freeway) looking southwest[a]	Local and regional motorists	340 feet	This southbound SR 13 motorist view shows a pair of project lattice towers and wood utility pole silhouetted against the sky and dense tree canopies on the west side of the freeway. The freeway pavement and concrete barrier railing are seen in the foreground. Dense vegetation limits the view west toward Dimond Canyon.
11. Bridgeview Trail in Dimond Canyon looking northeast	Recreationalists	460 feet	This view along the project alignment shows the two lattice towers located just west of SR 13 from Bridgeview Trail in Dimond Canyon Park. Viewed from an elevated perspective from across the canyon, the twin lattice structures contrast noticeably against the backdrop of dense vegetation. Red fencing and vehicles on Monterey Boulevard are seen in front of the towers, above the grassy slope.
12. Montclair Golf Course looking southwest	Recreationalists	560 feet	This is a view from Montclair Golf Course, near the head of Dimond Canyon Park, looking southwest toward the project alignment. In the foreground, parked vehicles at the golf course, along with storage containers, light poles, and clubhouse facilities are visible against a backdrop of dense trees on an embankment, and a pair of lattice towers are silhouetted against the sky.
13. Park Boulevard looking south	▪ Local and regional motorists ▪ Residents ▪ Recreationalists	420 feet	Where the alignment crosses Park Boulevard, a brief, relatively unobstructed close- range view of two project towers is available. In this motorist view, a prominent pair of lattice towers is seen long one of the principal arterials connecting Oakland Hills neighborhoods to Oakland's downtown. Beyond the towers between a break in roadside vegetation, there is a partial glimpse toward San Francisco Bay. In the foreground, additional built elements include a concrete-lined embankment to the right of the roadway, an adjacent wood utility pole supporting power lines, and a cobra-head streetlight, while, on the left, an architectural concrete traffic barrier lines the roadway and sidewalk.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 5.1-1. Summary of Representative Viewpoints and Photographs

Viewpoint Number, Location, and Viewing Direction[a]	Primary Viewers	Approximate Viewing Distance to Project	Existing Visual Conditions
13b. Park Boulevard looking northeast[a]	▪ Local and regional motorists ▪ Pedestrians ▪ Bicyclists	825 feet	This view from northbound Park Boulevard shows a motorist's view of the project alignment immediately north of where it crosses the roadway and ascends the largely wooded south slope of Dimond Canyon. Three pairs of lattice towers can be seen at approximately 800 feet near the top of the canyon, beyond a clearing within the otherwise densely vegetated terrain in view from the roadway. Four structures in the foreground are partially obscured at their base by vegetation and extend noticeably above the canyon wall against a sky backdrop, while two structures in the background are barely discernible because of intervening landforms and vegetation.
14. Leimert Bridge (historic landmark) looking north	▪ Local motorists ▪ Pedestrians	800 feet	This view from the historic Leimert Bridge, which spans Dimond Canyon, demonstrates that, when seen from this location, the project is somewhat less noticeable within the landscape where dense vegetation, including tall trees, dominate the view and vegetation on the embankment across the canyon partially screens two sets of lattice towers, including those on the right seen in Photograph 13. This view shows the alignment against a mottled backdrop that comprises vegetation, sky, and a mix of surrounding built elements such as buildings and numerous utility poles.
West Landscape Unit			
15. Park Boulevard at Estates Drive looking north	▪ Local and regional motorists ▪ School staff and students ▪ Church staff and attendees	240 feet	This view is from Park Boulevard looking north along Estates Drive. Near the center of this view, upper portions of two project lattice structures (also shown in Photograph 14 on the left) are silhouetted against the sky and seen beyond are a stand of low trees, part of a school building in the foreground, along with numerous overhead power and telecommunication lines that span the intersection in the immediate foreground. A prominent wood utility pole supports multiple power lines and transformers that connect an array of poles seen receding in the distance along Estates Drive.
16. Estates Drive near Sandringham Road looking south *	▪ Local motorists ▪ Residents ▪ School staff and students ▪ Church staff and attendees	180 feet	This view is looking south along Estates Drive toward Park Boulevard and the location of Photograph 15. The top sections of overlapping project lattice structures are silhouetted against the sky with the bottom screened by streetside landscaping. Also visible is an array of wood utility poles supporting overhead power and telecommunication lines amidst numerous street trees that line the west side of Estates Drive. Faintly visible in the distance are portions of the East Bay flatlands, San Francisco Bay, and the San Francisco Peninsula.
17. Hollywood Avenue near San Sebastian Avenue looking northwest*	▪ Local motorists ▪ Residents	325 feet	This open view from Hollywood Avenue shows a pair of lattice towers situated in a clearing on an elevated knoll at the end of the street. Two-story houses along this street occupy relatively compact lots with predominantly low-growing ornamental landscaping. The lattice structures are prominent elements in the landscape, seen along with parked cars and pavement, houses, ornamental trees and shrubs, and wood utility poles with multiple crossarms and numerous overhead conductors in the foreground.
18. Trestle Glen Road near Humphrey Place looking northeast	▪ Local motorists ▪ Residents	660 feet	This view is from a location along Trestle Glen Road where the project alignment comes within less than 200 feet of the residential street and shows portions of two lattice towers partially silhouetted against the sky. This street lined with two-story houses includes mature landscaping screening view of the hillside in the background. A single historic lamppost is seen in the center with no other utility poles visible.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 5.1-1. Summary of Representative Viewpoints and Photographs

Viewpoint Number, Location, and Viewing Direction[a]	Primary Viewers	Approximate Viewing Distance to Project	Existing Visual Conditions
19. Holman Road near Bates Road looking northeast*	▪ Local motorists ▪ Residents	190 feet	This view is looking northeast toward the project from along Holman Road near Bates Road showing a pair of prominent lattice towers, partially silhouetted against the sky. Parked cars, street pavement, and houses along with residential landscaping that includes trees and shrubs are seen in the foreground. Overhead power line conductors span the Bates Road/ Holman Road intersection and extend in both directions along Bates Road while unrelated power and telecommunication lines supported by a wood utility pole are visible in the immediate foreground.
20. Holman Road near Grosvenor Place looking northeast	▪ Local motorists ▪ Residents	230 feet	This view from Holman Road near Oakland X Substation and the western terminus of the project shows the eastern side of the large substation building partially screened by large street trees on the right. One historic lamp pole is seen on the right corner. A pair of Trestle Glen residences are seen on the left, backdropped by the slope and dense vegetation behind. Conductors and insulators are silhouetted against the sky. The upper story of an apartment building on Park Boulevard Way is partially visible.

[a] denotes KOP

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

5.1.1.7 Representative Photographs

Figures 5.1-2a through 5.1-2l present a set of 24 photographs taken from representative viewpoint locations along the alignment within the project viewshed. Detailed location coordinate data and other information is included in Appendix 5.1-1.

5.1.1.8 Visual Resource Management Areas

No Visual Resource Management Areas are applicable to the project.

5.1.2 Regulatory Setting

5.1.2.1 Federal

National Recreation Trails Program

The National Trails System Act of 1968 (Public Law 90-543) authorized creation of a national system of trails that comprises National Recreation Trails, National Scenic Trails, and National Historic Trails. While National Scenic Trails and National Historic Trails may only be designated by an act of Congress, National Recreation Trails may be designated by the Secretary of the Interior or the Secretary of Agriculture to recognize exemplary trails of local and regional significance in response to an application from the trail's managing agency or organization. Through designation, these trails are recognized as part of America's national system of trails (U.S. National Recreation Trails Program 2023).

The East Bay Skyline National Recreation Trail, one of 1,200 designated National Recreation Trails in the United States, is overlain with segments of the Bay Area Ridge Trail, a planned 550-mile multi-use trail along ridgelines ringing the San Francisco Bay Area. The 31-mile Skyline Trail traverses six of the EBRPD parks and preserves and is crossed by the project where it passes through Sibley Volcanic Regional Preserve and Huckleberry Botanic Regional Preserve (EBRPD 2023). A view from this trail is shown in Photo 3 on Figure 5.1-2b.

5.1.2.2 State

California Scenic Highway Program

The California Scenic Highway Program, a provision of the Streets and Highways Code, was established by the State Legislature in 1963 to preserve and enhance the natural beauty of California. The California Scenic Highway Program includes highways that are either 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 Caltrans for scenic highway approval, and receives the designation from Caltrans (Caltrans 2023). A city or county may propose to add routes with outstanding scenic elements to the list of eligible highways; however, state legislation is required for a highway to be officially designated.

The nearest designated state scenic highway is I-580, which passes the western end of the project route approximately 600 feet to the southwest; however, intervening vegetation and buildings generally screen views of the project from this highway.

5.1.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for air districts and CUPAs with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

This section reviews policies and regulations of these jurisdictions as they relate to visual resources in the project area.

City of Orinda General Plan

The Conservation Element of the *City of Orinda General Plan* contains the following policies for protecting and enhancing visual resources (Orinda 1987):

- POLICY 4.1.1G. Protect visually prominent ridgelines and hillsides from development.
- POLICY 4.1.1 N. Encourage undergrounding of power lines and replacement of utility towers with single poles.

The Land Use and Circulation Element of the *City of Orinda General Plan* includes a list of designated scenic corridors and policies to protect and enhance the visual character along these roadway corridors. The project does not cross and is not visible from any of these scenic corridors.

Contra Costa County General Plan (2005)

The *Contra Costa County General Plan,* Transportation and Circulation Element, includes a Scenic Routes Plan with a map of roadways that are designated as county scenic routes. One of these scenic routes, Pinehurst Road, is crossed by the project. The plan includes the following goals and policies related to aesthetics:

- Policy 5-47. Scenic corridors shall be maintained with the intent of protecting attractive natural qualities adjacent to various roads throughout the county.
- Policy 5-49. Scenic views observable from scenic routes shall be conserved, enhanced, and protected to the extent possible.
- 5-51. Multiple recreation use, including trails, observation points, and picnicking spots, where appropriate, shall be encouraged along scenic routes.
- Policy 5-55. Provide special protection for natural topographic features, aesthetic views, vistas, hills, and prominent ridgelines at "gateway" sections of scenic routes. Such "gateways" are located at unique transition points in topography or land use and serve as entrances to regions of the County.

The introduction to the Scenic Resources section of the Open Space Element of the *Contra Costa County General Plan* states the following regarding manmade facilities located on scenic ridges, hillsides, and rock outcroppings within the county: "…non-conforming signs and overhead utility lines, which are unattractive …should be eliminated or abated to enhance the scenic qualities of specific areas in the county."

Goals and policies regarding aesthetics include the following:

- Goal 9-A. To preserve and protect the ecological, scenic, cultural/historic, and recreational resource lands of the County.
- Goal 9-E. To protect major scenic ridges, to the extent practical, from structures, roadways, and other activities which would harm their scenic qualities.

East Bay Municipal Utility District East Bay Watershed Master Plan

The *East Bay Watershed Master Plan* contains policies and guidelines for district-owned lands within individual watershed management areas (defined as district-owned lands within each reservoir basin boundary). The project crosses a portion of EBMUD land within the Upper San Leandro Reservoir watershed between Moraga Substation and Sibley Volcanic Regional Preserve (EBMUD 2018). The

Upper San Leandro Reservoir Watershed Management Direction includes the following visual resources guidelines:

- USL.17 – Prohibit management practices or development proposals that would require large-scale modification of the Upper San Leandro Reservoir watershed landscape, especially in areas that are highly visible from Redwood Road, Anthony Chabot Regional Park, and other public viewpoints.

East Bay Regional Park District Master Plan

The 2013 *East Bay Regional Park District Master Plan* provides policy guidance for EBRPD's more than 1,200 miles of trails and approximately 113,000 acres of open space and parkland. The project alignment crosses the Sibley Volcanic Regional Preserve and Huckleberry Botanic Regional Preserve within EBRPD jurisdiction (EBRPD 2013).

The Master Plan Facility Development chapter outlines guidance for placement of utility lines and communication facilities within park lands, including the following:

- PRPT 28: The District will work in cooperation with the utility companies to place existing overhead utilities underground (unless so doing conflicts with applicable codes) as soon as practical and will work with other agencies to reduce visual impacts on adjacent lands. The District will seek to avoid the construction of high voltage power lines within the parklands, particularly in… preserve areas.
- PRPT 29: The District will keep its lands, including all ridges and peaks, free of additional communication facilities in order to maintain open viewshed, natural conditions, and public use as well as to limit vehicular and service activities.

Alameda County General Plan Scenic Route Element (1994 as amended)

The Scenic Route Element of *the Alameda County General Plan* includes a list of roadways that are designated as county scenic routes. The plan objectives include to conserve, enhance, and protect scenic views observable from scenic routes. The project intersects or comes near to the following County scenic routes:

- Skyline Boulevard – crossed by the project
- Warren Freeway (SR 13) – crossed by the project
- Park Boulevard – crossed by the project
- I-580 – passes within 800 feet but the project generally is not visible

City of Oakland General Plan

The *City of Oakland General Plan* guides development in the area and includes elements that contain provisions regarding visual resources, which are described in the following paragraphs.

The Scenic Highways Element (Oakland 1974) addresses the preservation and enhancement of those distinctly attractive roadways that traverse the city and the visual corridors that surround them. Both Skyline Boulevard and I-580 are designated as scenic routes.

The Open Space Conservation and Recreation Element (Oakland 1996) contains provisions for protecting and enhancing visual resources in the city, including the following.

- POLICY OS-10.1 VIEW PROTECTION: Protect the character of existing scenic views in Oakland, paying particular attention to: (a) views of the Oakland Hills from the flatlands; (b) views of downtown and Lake Merritt; (e) views of the shoreline; and (d) panoramic views from Skyline Boulevard, Grizzly Peak Road, and other hillside locations. (p. 2-65)

City of Piedmont General Plan

The City of Piedmont General Plan (2020) includes a Design and Preservation Element with goals and policies related to aesthetics. These include the following:

- Goal 27: City Identity and Aesthetics. Ensure that streets, parks, civic buildings, and other aspects of the "public realm" contribute to Piedmont's overall identity, beauty, and visual quality.
- Policy 27.3: View Preservation. Recognize and protect significant views in the city, particularly Piedmont's characteristic views of the San Francisco and Oakland skylines, Lake Merritt and San Francisco Bay, the Bay and Golden Gate Bridges, and surrounding hills, canyons, and geological features. Discourage the obstruction of such views by upper level additions, tall structures, and devices such as communication towers. Similarly, tree planting should avoid species or locations that will lead to the obstruction of desirable views.
- Policy 27.8: Utility Undergrounding. Support neighborhood efforts to underground utilities throughout Piedmont, with due consideration given to the level of community support and the financial impacts on the City and its residents. Underground utilities shall be required for any new subdivision.

5.1.3 Impact Questions

The impact questions include all aesthetic impact questions in the current version of CEQA Guidelines, Appendix G.

The project's potential effects on aesthetic resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.1-2 and discussed in more detail in the following sections. Section 5.1.4.6 includes additional discussion of visual change and the potential impact associated with the project.

Table 5.1-2. 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) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

5.1.3.1 Additional CEQA Impact Questions

None.

5.1.4 Potential Impact Analysis

Project impacts related to aesthetic resources were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.1.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the project."

As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on aesthetics were evaluated for each of the criteria listed in Table 5.1-2, as discussed in Section 5.1.4. The following sections describe significance criteria for aesthetic impacts derived from Appendix G of the CEQA Guidelines and additional CEQA impact questions and address potential project-related construction and operational visual impacts.

5.1.4.2 Applicant-Proposed Measures

PG&E will implement the following APMs:

APM Aesthetics-1 (AES-1): Aesthetics Impact Reduction During Construction. All project sites will be maintained in a clean and orderly state. Nighttime lighting will be directed away from residential areas and have shields to prevent light spillover effects. Upon completion of project construction, project staging and temporary work areas will be returned to pre-project conditions, including regrading of the site and revegetating or repaving of disturbed areas to match pre-existing contours and conditions.

APM AES-2: Use of Dulled Galvanized Finish or Corten Steel on Replacement Structures and Non-Specular Conductors. Use of a factory-dulled galvanized finish or Corten steel on replacement power line structures and non-specular (nonreflective) conductors will reduce the potential for a new source of glare and visual contrast resulting from the project.

5.1.4.3 Potential Impacts

Project impacts related to aesthetics were evaluated against the CEQA significance criteria and are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

Analysis of Visual Change

This section includes a description of the visual changes associated with the project and an evaluation of potential visual effects on key public views, primarily as represented by the set of 15 KOP visual simulations. Key factors in determining the degree of visual change are visual contrast, project dominance, and view blockage brought about by project elements. Visual contrast is a measure of the degree of change in line, form, color, and texture that the project will create when compared to the existing landscape. Project dominance is a measure of the project element's apparent size relative to other visible landscape features in the viewshed. View blockage is a measure of the degree to which project elements will obstruct or block views to landscape features based on the project's position and scale.

The significance or degree of visual impact is determined based on evaluation of visual change in relation to visual sensitivity factors, including visual quality of the landscape, number and types of viewers, and degree of exposure of viewers. Table 5.1-3 presents an overview of the visual changes, including viewpoint location with corresponding visual sensitivity factor(s), approximate viewing distance, and summary of visible change and potential effect that will occur at each KOP location. Refer to Table 3.3-4 for existing and replacement structure heights.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
East Landscape Unit			
KOP 2. Sibley Volcanic Regional Preserve McCosker Loop Trail looking northeast (Figures 5.1-3a and 5.1-3b)	▪ View from a well-traveled trail within a regional scenic preserve ▪ Viewers are recreational visitors to the preserve, which may include hikers, bicyclists, equestrians, and future campground users ▪ Moderate to high visual sensitivity	750 feet	▪ Two taller TSPs replace two existing PG&E LSTs supporting parallel alignments of double-circuit power line conductors near the same location at the crest of a grass-covered hilltop. ▪ Compared with the complex form of the existing lattice towers, the simple, narrow profile of the new replacement structures lessens visual contrast within the landscape while the increased structure height is not especially noticeable against the uniform sky backdrop. ▪ Removal of two existing wood poles reduces the total number of visible utility structures at the hilltop. ▪ Taken together, the visual change represents an incremental improvement to the existing landscape character at this public open space location.
KOP 3a. East Bay Skyline Trail looking northeast (Figures 5.1-4a and 5.1-4b)	▪ View from a well-traveled trail within a regional scenic preserve ▪ Viewers are recreational hikers on the trail ▪ Moderate to high visual sensitivity	1,250 feet to nearest structure	▪ Two pairs of taller LSTs replace two existing pairs of PG&E LSTs and one pair of TSPs supporting parallel alignments of double-circuit power line conductors near the same location on undulating grass covered terrain. ▪ The increased structure heights are not especially noticeable against the uniform hillside backdrop. ▪ The project represents a modest incremental change and does not substantially alter overall landscape character or quality at this public open space location.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
KOP 3b. East Bay Skyline Trail looking southwest (Figures 5.1-5a and 5.1 5b)	▪ View from a well-traveled trail within a regional scenic preserve ▪ Viewers are recreational hikers on the trail ▪ Moderate to high visual sensitivity	485 feet to nearest structure	▪ Two pairs of taller TSPs replace two existing LSTs supporting parallel alignments of double-circuit power line conductors near the same location on the hillside. ▪ Compared with the complex form of the existing lattice towers, the simple, narrow profile of the new replacement structures lessens visual contrast within the landscape while the increased structure height is not especially noticeable against the uniform sky backdrop. ▪ The two replacement structures do not significantly alter the existing character of landscape elements visible from this location, and the project will not obstruct distant panoramic views of a regional preserve. ▪ The project represents an incremental change and does not substantially alter overall landscape character or quality at this public open space location.
Central Landscape Unit			
KOP 4. Manzanita Drive looking west (Figures 5.1-6a and 5.1-6b)	▪ Viewers are residents and visitors to Swim and Tennis Club	240 feet to nearest structure	▪ Permanent removal of an existing LST and an existing TSP. ▪ Increased height of replacement structures shown on Figure 5.1-5 and on Figure 5.1-7 results in raising the height of overhead conductors crossing Manzanita Drive. ▪ Removal of project structures and increase in height of conductors reduces visual dominance of project at this location.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
KOP 5. Skyline Boulevard looking west (Figures 5.1-7a and 5.1-7b)	▪ Viewers are local motorists, recreational bicyclists, and residents ▪ Motorists are mainly local travelers, including commuting workers who are familiar with the visual setting ▪ Alameda County scenic roadway ▪ Moderate visual sensitivity	240 feet to nearest structure	▪ Two taller LSPs located marginally closer to the roadway replace one existing LST and one LSP. The taller LSP and the existing LSP being replaced are identical in form. To the right, the lower portion of a new LSP that replaces an LST is visible against a combination of vegetation and sky backdrop. ▪ Roadside vegetation partially screens the new replacement structures from the northbound roadway view. Increased structure heights could be most apparent to southbound motorists. ▪ Only fleeting motorist views of the project will be seen because of the winding and relatively narrow roadway alignment. ▪ The two replacement structures do not significantly alter the existing character of focal landscape elements visible from this location and the project will not obstruct distant panoramic views of San Francisco Bay. ▪ The project represents a modest incremental change and does not substantially alter overall character or quality of the existing landscape at this scenic roadway location.
KOP 6a. Balboa Drive looking northeast (Figures 5.1-8a and 5.1 8b)	▪ Viewers are primarily residents and local motorists ▪ Moderate to high visual sensitivity	300 feet to nearest structure	▪ Two pairs of moderately taller LSPs and a pair of TSPs replace six existing LSTs. Visible against a sky backdrop from a residential street and partially obscured by intervening vegetation, the new structures do not substantially deviate in appearance and aspect from the existing LSTs being replaced. ▪ Two replacement structures closest to the viewpoint, seen in isolation, dominate the street view based on their noticeably taller profile. ▪ Replacement structures do not substantially alter the existing character of the focal landscape in this area, consisting predominantly of densely vegetated sloping terrain, and where the prevailing orientation of residences near the project is away from project alignment toward Shepherd Canyon. ▪ The project represents a modest incremental change and does not substantially alter overall character or quality at this residential neighborhood location.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
KOP 6b. Thackeray Drive looking northwest (Figures 5.1-9a and 5.1 9b)	▪ Viewers are primarily residents and local motorists ▪ Moderate to high visual sensitivity	940 feet to nearest structure	▪ A pair of taller TSPs replace two existing LSTs and one LSP. ▪ Visible against a uniform backdrop of the mature tree canopy, the narrow, vertical profile of the replacement TSPs lessens visual contrast within the landscape, and the permanent removal of the LSP reduces project dominance within the focal landscape. ▪ The project represents a modest incremental change and does not substantially alter overall visual character or quality at this residential neighborhood location.
KOP 7. Montclair Railroad Trail in Shepherd Canyon Park looking north (Figures 5.1-10a and 5.1 10b)	▪ Viewers are recreationalists ▪ Moderate to high visual sensitivity	440 feet	▪ Existing project TSPs extended in height. ▪ Dense vegetation and sloping topography limit visibility of structures with only top section of structures visible from trail. ▪ Extended height represents an incremental increase in visual dominance of the project. ▪ Overall form of structures will not be substantially altered and will not substantially degrade visual character of landscape at this recreation site.
KOP 8a. Drake Drive at Rincon Drive looking south (Figures 5.1-11a and 5.1-11b)	▪ Viewers are primarily residents and local motorists ▪ Moderate to high visual sensitivity	400 feet	▪ A pair of nominally taller LSPs replace two existing LSTs in approximately the same location. Similar to the existing towers, replacement structures are primarily silhouetted against the sky, and dense vegetation largely screens their lower portions. ▪ While the upper portions of replacement structures closely resemble existing towers, the slender lower portion is more similar to the vertical form in the setting, including focal elements such as the utility pole and large tree seen in the foreground, thereby incrementally reducing the level of visual contrast. ▪ Visual change will not substantially affect existing landscape character at this residential neighborhood location.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
KOP 8b. Drake Drive at Magellan Drive looking northeast (Figures 5.1-12a and 5.1 12b)	▪ Viewers are primarily residents and local motorists ▪ Moderate to high visual sensitivity	210 feet	▪ Permanent removal of existing LSPs. ▪ Increase in height of existing project structures shown on Figure 5.1-10b and replacement of existing project structures with new taller structures shown on Figure 5.1-11b will result in incremental elevation of overhead power conductors at this location. ▪ Permanent removal of project structures reduces visual dominance of project at this location. ▪ Project will result in modest improvement of the landscape character at this residential neighborhood location.
KOP 10. State Route 13 (Warren Freeway) looking southwest (Figures 5.1-13a and 5.1 13b)	▪ Viewers are primarily local and regional motorists ▪ Moderate visual sensitivity	340 feet	▪ Two taller TSPs replace two existing project LSTs approximately 50 feet beyond the existing tower locations. ▪ Compared with the complex angular form of the existing lattice towers, the narrow, linear profile of the new replacement structures, along with the removal of cellular antennae from this location reduces visual contrast within the landscape. ▪ Increased height of replacement structures is not especially noticeable when viewed against the uniform sky backdrop. ▪ Roadside vegetation constrains distant views of project structures on approach to the freeway crossing, affording motorists only fleeting glimpses of project structures based on typical highway speeds and view angle toward the project structures. ▪ The project represents a moderate incremental visual change and does not substantially alter overall character or quality of the existing landscape at this scenic roadway location.
KOP 13b. Park Boulevard looking northeast (Figures 5.1-14a and 5.1 14b)	▪ Viewers are local motorists, recreational bicyclists, and nearby residents ▪ Motorists are mainly local travelers, including commuting workers who are familiar with the visual setting ▪ Alameda County scenic roadway ▪ Moderate visual sensitivity	825 feet to nearest structure	▪ Six marginally taller LSPs replace six existing LSTs. Visible against vegetation and sky backdrop, the replacement LSPs do not substantially deviate in form and aspect from the existing LSTs being replaced. ▪ Motorist views of the project will be fleeting because of the angle of view and curving segment of roadway at the viewpoint location. ▪ The replacement structures do not significantly alter the existing character of the focal landscape, consisting predominantly of densely vegetated sloping terrain within Dimond Canyon. ▪ The project represents a modest incremental change and does not substantially alter overall character or quality of the existing landscape at this scenic roadway location.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
West Landscape Unit			
KOP 16. Estates Drive near Sandringham Road looking south (Figures 5.1-15a and 5.1-15b)	▪ Close-range view of project elements from a well-used residential road within a dense residential community ▪ Near Corpus Christi School and Church ▪ Viewers are local motorists, pedestrians, nearby residents, school staff and students, church staff and attendees ▪ Moderate to high visual sensitivity	190 feet (foreground towers/ replacement riser poles) 445 feet (new riser poles)	▪ Two new taller tubular steel riser poles replace two existing LSTs in the foreground, and two new riser poles are located on Park Boulevard at the end of Estates Drive. Project overhead 115 kV circuits are relocated underground at this location. ▪ New power line structures will be seen in the context of nearby existing electric utility poles and overhead conductors, along with roadway infrastructure of similar material and form, such as traffic signals and roadside light standards. ▪ Introduction of riser poles will introduce an incremental increase in visual contrast compared with existing power line structures because of the unique form and height of two of the new structures and introduction of two additional structures; however, the slender, more linear appearance of the riser poles is more compatible in scale and form with the surrounding roadside utility infrastructure in this location. ▪ Given the presence of existing utility and infrastructure features, visual change, while noticeable, will not substantially degrade existing landscape character at this location.
KOP 17. Hollywood Avenue near San Sebastian Avenue looking northwest (Figures 5.1-16a and 5.1-16b	▪ Viewers are primarily residents and local motorists ▪ Moderate to high visual sensitivity	325 feet	▪ Rerouting and reconfiguration of project alignment underground results in permanent removal of two project LSTs and overhead conductors from this residential neighborhood. ▪ Removal of project structures and conductors substantially reduces visual dominance of power infrastructure at this location. ▪ Absence of project LSTs will result in an incremental improvement to the landscape character in this area.

Table 5.1-3. Summary of Visual Change at KOPs

Photograph Number and Location (Figure Number)	Visual Sensitivity Factor(s)	Approximate Viewing Distance	Visual Change and Effect
KOP 19. Holman Road near Bates Road looking northeast (Figures 5.1-17a and 5.1-17b	▪ Viewers are primarily residents and local motorists ▪ Moderate to high visual sensitivity	190 feet	▪ Rerouting and reconfiguration of project alignment underground results in permanent removal of two project LSTs and overhead conductors from this residential neighborhood. ▪ Removal of project structures and conductors substantially reduces the visual dominance of power infrastructure at this location. ▪ Absence of project LSTs will result in an incremental improvement to the landscape character in this area.

LSP = lattice steel pole
LST = lattice steel tower
TSP = tubular steel pole

KOP 2 – Sibley Volcanic Regional Preserve from McCosker Loop Trail looking northeast

Figure 5.1-3a is an existing view of the project taken from McCosker Loop Trail, a recreation trail within a largely undeveloped landscape crossed by the project west of Moraga Substation, where views across undulating terrain dominated by open grassland and scattered oak woodland are afforded recreational visitors. This viewpoint is also at the site of a planned group campground. Two prominent LSTs can be seen silhouetted against the sky where the project alignment crests a nearby ridgetop.

The Figure 5.1-3b simulation shows the existing LSTs replaced by two taller TSPs in approximately the same location. The increased height of the new structures is not particularly noticeable against the uniform sky backdrop. The simulation also demonstrates that the predominantly linear, narrow profile of the new TSPs will result in a reduced level of visual contrast within the landscape when compared with the wider, more complex angular form of the existing LSTs. Additionally, the removal of two existing wood poles will be a beneficial visual change. Although the level of visual sensitivity within this public recreation area is considered moderate to high based on potential long-duration views on the part of recreationalists, the degree of visual change is incremental, and the project will not substantially alter the existing landscape character at this location.

KOP 3a – East Bay Skyline Trail looking northeast

Figure 5.1-4a is an existing view of the project taken from where the alignment crosses the East Bay Skyline Trail (Bay Area Ridge Trail), part of a 31 mile-long regional recreational trail that passes through Sibley Volcanic Preserve. This elevated perspective near the western boundary of the Preserve, shows multiple lattice towers spanning the public open space, crossing undulating terrain cloaked with dense underbrush and scattered oak woodland that highlights a pair of lattice towers in the foreground, giving way to increasingly barren grassland in the distance where visibility of project towers diminishes with distance.

The Figure 5.1-4b simulation shows the replacement of three existing pairs of project structures appearing closest to the viewpoint, that include two pairs of slightly taller LSTs that are similar in form to those removed, and between the two sets of LSTs, a pair of somewhat taller TSPs. Viewed against the largely uniform landscape backdrop from the vantage point of the KOP, the increase in height of the new structures is not particularly discernible. When seen at this distance, the narrow vertical profile of the TSPs introduces an incremental level of contrast when compared to the wider, more complex angular form of the LSTs. Although the level of visual sensitivity within this public recreation area is considered moderate to high based on potential long-duration views on the part of recreationalists, views from this comparatively narrow trail segment will potentially be somewhat fleeting. Overall, when comparing the existing and post project KOP view, the degree of visual change is incremental, and the project will not substantially alter the existing landscape character at this location.

KOP 3b – East Bay Skyline Trail looking southwest

Figure 5.1-5a is an existing view of the project from approximately the same location along the East Bay Skyline Trail (Bay Area Ridge Trail) shown in KOP 3a, looking uphill to the southwest along the project ROW, near where the alignment crests the Oakland Hills summit. From this perspective, dense vegetation above the trail in the immediate foreground gives way to an unobstructed, relatively close-range view of a pair of project lattice towers, along with an adjacent wood utility pole, that are prominently silhouetted against a sky backdrop.

The Figure 5.1-5b simulation shows the replacement of the existing pair of lattice towers with a pair of taller TSPs approximately 30 feet uphill from the existing structure locations. Viewed against the largely uniform sky backdrop from the vantage point of the KOP, the increase in height of the new structures is not particularly discernible in relation to the existing structures that have been removed. Compared to the wider, more complex angular form of the LSTs that have been replaced, the slender vertical profile of the TSPs represents an incremental change that reduces the level of visual contrast of the project at this location. Although the level of visual sensitivity within this public recreation area is considered moderate to high based on potential long-duration views on the part of recreationalists, considering the incremental degree of visual change represented by the new structures, the project will not substantially alter the existing landscape character at this location.

KOP 4 – Manzanita Drive looking west

Figure 5.1-6a is an existing view of the project looking west along Manzanita Drive, a residential street at the Oakland/Berkeley Hills summit bordering Huckleberry Botanic Regional Preserve and access to the Skyline Trail and Sibley Volcanic Preserve to the southeast. This view shows a pair of prominent project structures silhouetted against the sky, with overhead conductors angling sharply downhill to the left. Mature tree canopy and surrounding dense landscaping partially block views of the project from the residence in the foreground. Other built elements in the foreground include a steel cobra-head light pole along the street, driveways and a parking area on the right for a nearby private athletic club, and access to the Huckleberry Botanic Regional Preserve bordering the east side of this street.

The permanent removal of project structures at this location is shown on the Figure 5.1-6b simulation. The simulation also shows the elevated configuration of overhead conductors, an outcome of the increased height of the replacement structures shown in the KOP 3b and KOP 5 simulations (Figure 5.1-5b and Figure 5.1-6b), which permits an extended span length between the adjacent replacement structures and the elimination of intervening structures. A comparison between the existing view and post-project simulation demonstrates that absence of project structures at this location will represent a noticeable reduction in visual dominance of the project and an improvement to the character of the landscape viewed by residents and visitors at this location.

KOP 5 – Skyline Boulevard looking west

Figure 5.1-7a is a view taken from northbound Skyline Boulevard, an Alameda County-designated scenic roadway, showing a motorist's view of the project alignment where it crosses the roadway within the densely wooded, relatively steep southwest-facing upper flank of the Oakland Hills. This west-facing view shows characteristic landscape along the roadway in this area, including almost continuous stands of mature trees, interspersed with scattered residential clusters, as well as intermittent brief distant open views toward the San Francisco Bay. Beyond the stand of trees visible in the immediate foreground, the project crossing appears at the bend in the road. Near the center of this view, a prominent existing project LSP is silhouetted against the sky while, on the right above the steep embankment, the lower portion of a project LST is somewhat noticeable against a backdrop of dense vegetation. Visual sensitivity at this location is considered moderate based on the brief duration of motorists' and bicyclists' views, as well as the limited number of residences near to the project structures.

The Figure 5.1-7b simulation, a view approximately 300 feet from the project's roadway crossing, shows a new, taller replacement LSP slightly closer to the road, near the center of the view. The form of this new structure and the one it replaces is almost identical while, on the right above the roadway, the narrow vertical form of a new project LSP can be seen in place of the existing LST. Although taller than the existing structures, when seen at relatively close range as shown in the simulation, vegetation and topography will partially screen views of the new structures on the part of northbound roadway travelers. From greater distances, where open views of individual structures will potentially be seen, views from Skyline Boulevard will be only fleeting based on the relatively narrow and winding roadway alignment. The replacement structures do not significantly alter existing views of focal landscape elements visible from this location, including distant views of San Francisco Bay. Additionally, seen in the context of existing adjacent electrical infrastructure that includes roadside utility poles and overhead power and telecommunication lines in the immediate vicinity, a comparison between the existing view and post-project simulation demonstrates that the level of visual change will be moderate and incremental and will not substantially alter the overall character of the landscape character at this location.

KOP 6a – Balboa Drive looking northeast

Figure 5.1-8a is a view from a narrow hillside road that provides access to residences situated approximately 500 feet above Shepherd Canyon Road and approximately 40 feet from the project ROW. In the center of this view, previous removal of mature trees and slope recontouring results in a relatively unobstructed view toward the project, that includes multiple pairs of LSTs, and overhead conductors receding toward the distant summit, the closest structures situated approximately 300 feet from the viewpoint. In the foreground to the right, surrounded by dense canopies of mature trees, a line of fencing adjacent to a row of parked cars delineates the backs of several residences that overlook Shepherd Canyon, and a wood utility pole supporting power lines and telecommunication cable, partially screened by vegetation, can be seen in the left center of the view.

The Figure 5.1-8b simulation shows two noticeably taller LSPs approximately 275 feet from the viewpoint having replaced the two closest LSTs. In the distance, existing LSTs have been replaced with a pair of slightly taller TSPs and two pairs of LSPs, only partially visible due to intervening vegetation and distance from the viewpoint. The upper portion of the replacement structures in the foreground closely resembles the form, color, and texture of the existing LSTs that have been removed and are identical to the new LSPs visible in the background. However, based on their taller profile in conjunction with proximity to the viewpoint, the replacement structures that appear in the foreground become a dominant element in this street view. Visual sensitivity in this location is considered moderate to high given the long-duration views of the project potentially available to nearby residents. However, based on familiarity with local power and communication infrastructure in the immediate vicinity visible to residents, as well as the presence of surrounding vegetation that fully or partially screens the project from the majority of residences, together with the prevailing orientation of residences outward from the project alignment toward Shepherd Canyon, the moderate degree of visual change associated with the project will not substantially degrade the existing visual character of the landscape at this location.

KOP 6b – Thackeray Drive looking northwest

Figure 5.1-9a shows a view of the project available to some residents and local motorists looking across Shepherd Canyon from the south. Largely surrounded by mature vegetation, portions of several residences situated along the edge of the north-facing slope of Shepherd Canyon can be seen in the foreground in this street view. A prominent wood utility pole supporting multiple overhead power and telecommunication lines is visible on the right. On the opposite side of the canyon, visible on the left in the middle distance approximately 940 feet from the viewpoint, a pair of light-colored project LSTs are visible against a dominant backdrop of dark, mature tree canopies. In the center of the view, beyond the garage roof in the foreground, a single project LSP can be seen partially backdropped by a residential structure and distant tree canopy.

The Figure 5.1-9b simulation shows the replacement of the existing LSTs on the left with two taller TSPs and shows the existing LSP in the center of the view permanently removed. Compared to the complex, angular form of the existing lattice towers shown on Figure 5.1-9a, the narrow, linear profile of the replacement TSPs represents an incremental reduction of visual contrast within the focal landscape. The increased height of the TSPs, while potentially noticeable, will not extend above the existing backdrop of mature trees and will not substantially alter the visual dominance of the project at this location. In addition, the permanent removal of the existing lattice structure in the center of the view will contribute to an overall reduction of visual dominance of the project as seen from this KOP (as well as from the residence situated directly behind the existing structure that will be removed). Visual sensitivity in this location is considered moderate to high based on the long-duration views of the project from nearby residences. However, given the context of existing adjacent electrical infrastructure that includes roadside utility poles and overhead power and telecommunication lines in the immediate vicinity of this KOP, a comparison between the existing view and post-project simulation demonstrates the degree of visual change is incremental and the project will not substantially alter the existing landscape character at this residential neighborhood location.

KOP 7 – Montclair Railroad Trail in Shepherd Canyon Park looking north

Figure 5.1-10a is an existing view of the project taken from Montclair Railroad Trail, located within Shepherd Canyon Park, a public open space that parallels the west side of Shepherd Canyon. Looking north from this location, dense vegetation and sloping terrain visible on both sides of the trail in the foreground largely constrain open views within the canyon. Trail users are afforded a limited view of a pair of existing project Corten TSPs that are seen in the middle distance beyond a stand of mature trees, with only the top part of the structures visible against a sky backdrop from this trail location.

The Figure 5.1-10b simulation shows the upper portion of the existing TSPs extended in height well above the tree canopy. Compared to the existing structures seen on Figure 5.1-10a, the increased height of the modified structures will potentially be noticeable to trail users when viewed from this location. Because the overall form of the structures will not be substantially altered, the visual effect will represent a modest incremental increase in the visual dominance of the project. Visual sensitivity in this location is considered moderate to high based on potential long-duration views on the part of recreational users of the trail. However, considering the prevailing topography and density of adjacent vegetation coupled with the predominantly horizontal visual orientation of trail users, the degree of visual change associated with the project will not substantially degrade the existing visual character of the landscape at this location. KOP 8a – Drake Drive at Rincon Drive looking south

Figure 5.1-11a is a view from the southern edge of a hillside residential development situated immediately above Shepherd Canyon Park that closely parallels the project ROW. In this street perspective looking toward the project alignment, the foreground shows a mix of tall trees and dense lower vegetation surrounding nearby residential properties, along with a prominently visible wood utility pole supporting an array of overhead power and telecommunication lines. Visible at approximately 400 feet near the center of the view is a pair of LSTs, largely silhouetted against the sky, while lower portions of the structures are somewhat less visible against a backdrop of distant trees.

The Figure 5.1-11b simulation shows two taller LSPs in place of the existing LSTs that have been removed. Although the increased height and altered form of the new project structures will be potentially noticeable, compared to the existing structures the difference is incremental and will not increase the visual dominance of the project as seen in this view. While the uppermost sections closely resemble the form of the existing structures, the slender, linear shafts of the new structures, seen in the context of vertical forms including utility poles and the predominant vertical axis of numerous trees that are characteristic features of the surrounding landscape in this location, represent a modest reduction in the level of visual contrast in the environment. Although visual sensitivity in this location is considered moderate to high based on the long-duration views of the project from nearby residences, given their familiarity with local power and communication infrastructure, as well as the surrounding vegetation that fully or partially screen the project from the majority of residential viewers, the degree of visual change associated with the project will not substantially degrade the existing visual character of the landscape at this location.

KOP 8b – Drake Drive at Magellan Drive looking northeast

Figure 5.1-12a is a view looking northeast from near KOP 8, showing an open view of a residential property facing Drake Drive where it intersects Magellan Drive. Visible in the immediate foreground to the right, along with street signage, is a wood utility pole connected to numerous guy wires and telecommunication cable. Predominantly low ornamental plants are visible in the front of the property and the general absence of mature vegetation in proximity to the residence affords an unobstructed view of the upper portion of a pair of project lattice poles, located approximately 100 feet beyond the residence.

The permanent removal of the project structures and the somewhat higher elevation of the replacement conductors is shown on the Figure 5.1-12b simulation, as a result of the increase in height of replacement structures shown in the KOP 7 and KOP 8 simulations (Figure 5.1-10b and Figure 5.1-11b). A comparison between the existing view and post-project simulation demonstrates that the absence of project structures at this residential location will represent a noticeable reduction in the visual dominance of the project along with an incremental improvement of the visual character of the landscape viewed by residents, pedestrians, and local motorists at this location.

KOP 10 – State Route 13 (Warren Freeway) looking southwest

Figure 5.1-13a is a southbound motorist view of the project crossing of SR 13, an Alameda County scenic roadway, showing a pair of project LSTs and wood utility poles on the west side of the freeway, against a backdrop of dense tree canopies and partially silhouetted against the sky. Cellular antennas are seen at the top of the tower on the left. The freeway pavement and concrete barrier railing are seen in the foreground, with a vehicle on the southbound lane discernible a short distance beyond. Dense vegetation limits the view west toward Dimond Canyon.

The Figure 5.1-13b simulation shows two taller TSPs replacing the existing LSTs approximately 50 feet beyond the existing tower positions and the permanent removal of the cellular antennas from this project location. Compared with the broad, angular form of the existing LSTs, the narrow, linear profile of the new structures reduces the degree of visual contrast exhibited by the project within the landscape. Although taller than the LSTs that have been removed, similar to the existing project structures, the upper portions of the replacement TSPs are seen against a uniform sky backdrop and the height difference is not particularly discernible. Dense roadside vegetation and shifting roadway topography that characterizes the approach to the project crossing constrain distant views of the project. As a result, motorists are afforded only a fleeting glimpse of project structures given typical highway speeds coupled with the perpendicular view angle of replacement structures available to motorists. When seen in the context of adjacent electrical infrastructure that includes utility poles and overhead power and telecommunication lines in the immediate vicinity of the replacement structures, a comparison between the existing view and post-project simulation demonstrates that the project represents a modest incremental visual change and does not substantially alter overall character or quality of the existing landscape at this scenic roadway location.

KOP 13b – Park Boulevard looking northeast

Figure 5.1-14a is a view taken from northbound Park Boulevard, an Alameda County-designated scenic roadway, showing a motorist's view of the project alignment immediately north of where it crosses the roadway and ascends the largely wooded south slope of the Dimond Canyon. Three pairs of LSTs can be seen at approximately 800 feet near the top of the canyon, beyond a clearing within the otherwise densely vegetated terrain in view from the roadway. Four structures in the foreground are partially obscured at their bases by vegetation and extend noticeably above the canyon wall against a sky backdrop, while two structures in the background are barely discernible due to intervening landform and vegetation.

The Figure 5.1-14b simulation shows three pairs of somewhat taller LSPs replacing the existing LSTs at approximately the same locations. Visible against the uniform sky backdrop, the increased height of the new structures is not particularly discernable. Although the upper portion of the replacement structures are largely comparable in appearance to that of the existing LSTs, the narrow vertical lower sections of the new structures deviate somewhat in form from the broad, angular appearing base of the existing structures. While individually the new LSPs maintain the transparent lattice pattern of the structures that have been replaced, lower structures seen against the darker landscape backdrop gives the project a somewhat denser overall appearance and represents a slight increase in the degree of visual contrast. Visual sensitivity in this location is considered moderate and, given the elevated angle of view of the project coupled with the winding roadway segment at this viewpoint that draws attention of northbound drivers away from the project elements, affords at best fleeting views of the project for motorists and bicyclists who constitute the majority of viewers. Seen in the context of existing adjacent electrical infrastructure that includes roadside utility poles and overhead power and telecommunication lines in the immediate vicinity along Park Boulevard, a comparison between the existing view and post-project simulation demonstrates that the level of visual change will be incremental and will not substantially degrade the overall character of the landscape at this location.

KOP 16 – Estates Drive near Sandringham Road

Figure 5.1-15a is a close-range view toward the project from Estates Drive, a well-used roadway within a dense residential community. Taken near its intersection with Sandringham Road, from approximately 190 feet, the center of view shows the upper portions of two prominent project LSTs beyond a stand of low trees and parked vehicles in the foreground. Silhouetted against the light sky backdrop, the complex geometric form of the towers, along with numerous cellular antennas mounted to the closer of the two structures, is a dominant landscape feature seen at this location. An array of wood utility poles supporting overhead power and telecommunication lines recede along Estates Drive amidst numerous street trees. In the distance, portions of the East Bay flatlands, San Francisco Bay, and the San Francisco Peninsula are faintly visible.

The Figure 5.1-15b simulation shows removal of the existing LSTs and their replacement with TSPs where the project overhead 115 kV circuits are relocated underground; the two new taller riser poles are located adjacent to where the lattice towers have been removed. On the left, two additional new riser poles are located to the southwest along Park Boulevard at the end of Estates Drive, approximately 450 feet from the viewpoint; only the tops of these new structures are visible beyond the trees. The simulation also shows the removal of two trees located on Estates Drive in conjunction with the project. The introduction of four new structures in place of the two LSTs represents an increase in visual contrast within the landscape. At the same time, the slender, more linear appearance of the riser poles is more compatible in scale and form with the surrounding roadside utility infrastructure in this location. In addition, the presence of the riser poles will not materially impact distant views available at this location, and the tree removal will result in an incremental expansion of the distant panorama. A comparison between the existing view and post-project simulation demonstrates that, overall, the level of visual change resulting from the removal of the existing project LSTs and the introduction of riser poles will not substantially degrade the existing visual character of the landscape at this location.

KOP 17 – Hollywood Avenue near San Sebastian Avenue

Figure 5.1-16a is an existing view of the project looking northeast along Hollywood Avenue, a residential street in the vicinity of Park Boulevard. This view shows a pair of project LSTs situated in a clearing on an elevated knoll at the end of the street. Houses along this street occupy relatively compact lots with predominantly low-growing ornamental landscaping. The project structures stand out as dominant features in the landscape, seen along with parked cars and adjacent wood utility poles with multiple crossarms supporting numerous overhead power and telecommunication lines in the foreground.

Figure 5.1-16b shows the permanent removal of the existing project LSTs and overhead conductors from this location because of rerouting the project alignment to Park Boulevard, where it will be located underground. Comparing the existing and post-project KOP view demonstrates that the removal of the existing project LSTs will represent an incremental improvement to the landscape character within this residential neighborhood.

KOP 19 – Holman Road near Bates Road

Figure 5.1-17a is an existing view looking northeast toward the project alignment where the ROW parallels Holman Road near its intersection with Bates Road and passes directly over a residence facing the intersection. Directly behind the residence, in the foreground and dominating the view, is a pair of LSTs and associated conductors.

Figure 5.1-17b shows the permanent removal of the existing project LSTs and overhead conductors from this location because of rerouting the project alignment to Park Boulevard, where it will be located underground. A comparison of the existing and post-project KOP view demonstrates that the removal of the existing project LSTs will represent a substantial improvement to the landscape character within this residential neighborhood.

a) Would the project have a substantial adverse effect on a scenic vista? *Less-than-Significant Impact*.

CEQA requires that the project be evaluated as to whether its implementation has a substantial, adverse effect on a scenic vista. For purposes of 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. There are no specific recognized scenic vistas within the project viewshed. As noted in Section 5.1.3, the *City of Oakland General Plan* Open Space and Recreation Element (1996) contains provisions for protecting and enhancing visual resources in the city, among them to protect the character of existing scenic views within the city that include panoramic views from hillside corridors. These include Skyline Boulevard, crossed by the project along a partially wooded stretch of roadway that affords a limited view of the San Francisco Bay. Project modifications include replacement of the existing LSP at this location with a taller LSP; however, based on its siting near the roadway edge at an area with steeply descending terrain, the project structure will not alter existing distant views of the Bay as seen by motorists, pedestrians, or bicyclists. Figures 5.1-4a and 5.1-4b show a close range existing and post-project view that demonstrate the project will not substantially affect or obstruct the distant view of San Francisco Bay available from Skyline Boulevard.

Therefore, there will be no adverse effect on a scenic vista as a result of the project, and there will be no significant impact.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? *Less-than-Significant Impact.*

As documented in Section 5.1.2.2.1, the PG&E Oakland X Substation could be seen from a small section of I-580, the nearest designated state scenic highway, which passes approximately 600 feet west of the substation. Because the replacement project alignment will transition underground beginning approximately 1.2 miles east of the substation, aboveground project replacement structures east of the transition will be largely imperceptible because of distance and urban backdrop conditions. One of three new riser poles that will connect the underground portion to the substation, and the removal of existing power lines and towers could potentially be visible to motorists from I-580 at the Park Boulevard under crossing, where dense vegetation lining the freeway embankment gives way to an open view of the substation uphill project alignment. However, given the perpendicular motorist's view angle and given typical roadway velocity at this location, visibility will be fleeting, and the riser pole itself will be seen in the context of utility infrastructure, including light standards of similar form. The removal of the existing towers, to the extent they are visible, will be a positive visual change. Overall, the perceived change will be minor and incremental and, therefore, the project will not substantially damage scenic resources within a state scenic highway.

Some of the power line replacement structures will potentially be visible from Alameda County scenic routes in the project area. These include Skyline Boulevard, Pinehurst Road, the Warren Freeway (SR 13), and Park Boulevard, all of which are crossed by the project; and I-580 that is within view of the project terminus at Oakland X Substation as noted previously. As demonstrated by Figures 5.1-7a and 5.1-7b, and noted previously, project-related change will not substantially affect the view from Skyline Boulevard. Views of the PG&E power line crossing from Pinehurst Road, located within EBMUD watershed land, is largely constrained by dense woodland. Although open views of project components will be visible from more urban locations these will be seen in the context of existing utility lines and related infrastructure that align these roadways. In the case of the Warren Freeway (SR 13), affected views of the project alignment, illustrated on Figures 5.1-13a and 5.1-13b, will be fleeting given typical highway speeds along this stretch of roadway (posted speed limit of 65 miles per hour). While speeds along Park Boulevard are lower, views toward the project on the part of motorists and bicyclists will be relatively brief given the elevated, angled view of the project alignment and the landscape screening along the roadway. Moreover, as shown on Figures 5.1-14a and 5.1-14b and as noted in Section 5.1.4.6, project-related change seen from Park Boulevard will be incremental and will not substantially alter the view of the alignment from Park Boulevard. Overall, considering conditions described previously, the project will not have a substantial effect on views from local scenic roadways in the project area. There will be a less-than-significant impact.

c) In nonurbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? *Less-than-Significant Impact.*

PG&E's replacement of its facilities will occur between Moraga Substation in Orinda, located in suburban Contra Costa County, and Oakland X Substation, located in a highly urbanized setting in the City of Oakland. The project alignment includes a 1.7-mile segment through an EBRPD lands consisting of unincorporated largely undeveloped watershed land. The project alignment also passes through low-density hillside residential neighborhoods and an urban creek watershed preserve within the City of Oakland.

The impact analysis focuses on substantial adverse impacts to the existing visual character or quality of public views of the site and its surroundings, in addition to potential conflicts of the project with applicable regulations governing scenic quality.

Temporary Construction Impacts

Construction-related visual impacts resulting from the temporary presence of equipment, materials, and work crews at Moraga and Oakland X substations, as well as along the project alignment, including staging and work areas and stringing sites, will not substantially degrade the existing visual character or quality of the site and its surroundings. During construction, visual impacts will include the temporary presence of workers, temporary structures, construction equipment, and vehicles associated with the installation of poles, conductors, duct banks, and belowground conduits.

Replacement of the power lines will occur within a mixture of recreational open space and wooded suburban residential areas and along urban residential transportation corridors. The installation of the underground conduit will occur along Park Boulevard. Although construction activities will be visible to motorists and a limited number of recreationalists and residents at these locations, adjacent structures and vegetation will provide some measure of screening of these activities. APM AES-1 calls for construction staging, material storage, and work areas to be in a clean and orderly state and nighttime lighting to be directed away from residential areas and have shields to prevent light spillover effects.

Project work areas will be mainly within or adjacent to the project ROW, existing access routes, and PG&E properties. For the most part, the project will use the existing network of public roads to access structure work areas, pull and tension sites, excavation sites for underground conduit, and staging areas, with few temporary construction easements expected. In many cases, views of construction activities available to nearby residents will be limited. Hillside residences generally are somewhat isolated and, for the most part, are surrounded to varying degrees by mature vegetation and intervening topography that limit open views across the landscape. Local roadways crossed by the project, such as Skyline Boulevard and Manzanita Road, generally carry light and intermittent traffic and have a low residential density with abundant mature vegetation. Motorists in more heavily traveled locations, such as Park Boulevard, potentially will have more open views of staging and laydown areas as well as construction activities where the overhead project route crosses this roadway and underground conduit will be installed. Where the project crosses SR 13, visibility of construction activities generally will be fleeting given the angle of view and typical roadway speeds. Construction is expected to take approximately 35 months, although construction activity will be visible for considerably less time at any one location along the project alignment.

Project construction will require minimal grading and, while some permanent removal of existing vegetation will be necessary this will be limited for the most part to vegetation that encroaches on existing access and spur roads, stringing sites, construction laydown and work areas, staging yards, and helicopter landing zones to permit the safe operation of construction equipment. However, locations of these areas will be selected to minimize the effects on existing vegetation, and in instances where tree removal is required, new replacement trees will be planted post construction as feasible. Thus, the overall visual effects of vegetation removal generally will be minor and temporary and not particularly noticeable to the public.

Underground segment construction along Park Boulevard will include trenching work and the closure of one travel lane and one parking lane during the underground line construction, with one lane remaining open to allow through traffic. Approximately 100 to 200 feet of trench will be open at any one time. Although construction will be visible to relatively large numbers of local motorists and residents overall, the visual effects will be limited to small areas at any one time.

Installation of replacement structures, temporary guard poles, and other structures will result in minor disturbance of land along the project alignments. Temporary staging and work areas that will be established as part of the project construction will be located where possible on previously disturbed land located near or along the project alignment. As outlined in APM AES-1, following the completion of construction, all areas temporarily disturbed by construction activities will be restored to conditions as close to preconstruction conditions as feasible, including implementation of measures that will reduce visual contrast and potential visibility of land disturbance resulting from temporary construction activities. Given the limited number of affected viewers with long duration or close-range project views, temporary construction-related visual effects will be less than significant.

Permanent Construction Impacts

The project will rebuild the existing 5 miles of overhead double-circuit 115 kV power lines and 76 structures between Moraga and Oakland X substations, including the replacement of approximately 46 structures, the modification of 8 structures, and the removal of 22 structures. Refer to Table 3.3-4 for existing and replacement structure heights. The replacement structures will include a combination of LSTs, LSPs, and TSPs, and along an approximately 1.2 mile segment, beginning near the confluence of Estates Drive and Park Boulevard in the City of Piedmont, the relocation of the alignment underground within the roadway ROW along Park Boulevard to Oakland X Substation. The existing power line structures located along the existing alignment between Estates Drive and Oakland X Substation will be permanently removed. Four new riser poles will be installed at the point of connection with the underground portion of the project at the Park Boulevard/Estates Drive intersection, and three new riser poles will be installed within Oakland X Substation easement to facilitate the connection of the underground portion of the alignment to the substation.

Permanent visual change resulting from modifications to the existing PG&E alignment will be noticeable but largely incremental and will not substantially alter or degrade the existing visual character of the landscape within the project area. The proposed replacement structures along the overhead portion of the project alignment will be primarily located within the existing PG&E ROW and generally situated near the current locations of existing structures to be removed. Intervening vegetation and built structures will fully or partially screen public views of the project to a large degree. For the most part, modifications to existing PG&E 115 kV lines will occur in a predominantly urban context, where established landscape features seen in public views include a variety of existing infrastructure, such as wood power poles and lattice power line structures.

The visual modifications to the landscape will be experienced to varying degrees by motorists, bicyclists, residents, and visitors to recreation areas within the project area. While distant, open views toward the project will be available from limited locations in the area, the visual change associated with the project will potentially be most noticeable where the alignment closely parallels or crosses public roadways, as well as where the project alignment passes near visually sensitive areas such as residential properties or recreation areas where, in some cases, relatively close-range and medium- to long-duration views of project elements could be seen.

Within the East Landscape Unit, the project extends approximately 1.7 miles across largely undeveloped lands primarily owned by EBRPD and EBMUD, traversing undulating terrain dominated by open grassland and scattered oak woodland, and intersected by several public recreation trails. Figures 5.1-3a and 5.1-3b, an existing and a post-project KOP view, show an open view of the project taken from McCosker Loop Trail at the planned group camping and interpretive site in Sibley Volcanic Regional Preserve. The existing view shows two prominent lattice towers silhouetted against the sky where the alignment crests a nearby ridgetop, along with two smaller wood poles to their right. The Figure 5.1-3b simulation portrays two somewhat taller TSPs in approximately the same location. The increased height of the replacement structures is not particularly noticeable against the uniform sky backdrop. Additionally, because of the sleeker, narrow profile of the new structures, the degree of visual contrast is diminished when compared to the more complex form of the existing towers.

Figures 5.1-4a and 5.1-4b, an existing and a post-project KOP view, shows a broader perspective of the project alignment where it crosses the Sibley Volcanic Preserve. Taken from the East Bay Skyline Trail near the western boundary of the Preserve where it intersects the alignment, the existing view shows multiple lattice towers spanning the breadth of the preserve. Seen within the broad, open landscape from this vantage point, the scale of existing project elements does not particularly dominate the view, and given the predominantly light, uniform backdrop of open grassland and sky, their visibility diminishes with distance. The Figure 5.1-4b simulation shows the replacement of three existing pairs of project structures closest to the viewpoint that, in addition to the pair of TSPs referenced previously, include two pairs of slightly taller LSTs nearly identical to those removed, whose height difference is nearly imperceptible from the KOP vantage point.

Figures 5.1-5a and 5.1-5b are existing and post-project KOP views from approximately the same location along the East Bay Skyline Trail (Bay Area Ridge Trail) shown on Figure 5.1-4a, looking to the southwest along the project ROW. This uphill-facing perspective shows an unobstructed, relatively close-range view of a pair of project lattice towers along with an adjacent wood utility pole. Silhouetted prominently against the sky backdrop, the existing project structures are relatively dominant elements in the landscape. The Figure 5.1-5b simulation shows the replacement of the existing lattice towers with a pair of taller TSPs at approximately the same location. Although the increase in height of the new structures will be potentially discernable in relation to the existing structures that have been removed, when compared to the wider, more-complex form of the LSTs that have been replaced, the slender, vertical profile of the TSPs represents an incremental change that reduces the visual contrast of the project. The degree of change does not noticeably increase the visual dominance of the project at this location.

The level of visual sensitivity within this public recreation area is considered moderate to high based on potential long-duration views on the part of recreationalists; however, considering the effects described previously, the incremental level of visual change of the project will not substantially affect the existing landscape character at this location.

Figures 5.1-6a and 5.1-6b, existing and post-project KOP views looking west along Manzanita Drive at the Oakland/Berkeley Hills summit, show the project crossing a residential street that borders the Huckleberry Botanic Regional Preserve and provides trail access to the Skyline Trail and Sibley Volcanic Preserve to the east. Taken from a parking area of a nearby private athletic club, a pair of project structures visible above the dense tree canopy lining the roadway are prominent elements in the existing view, where they are seen against the sky backdrop. The Figure 5.1-6b simulation shows the removal of the existing project structures because of the increased height of adjacent project structures shown on Figures 5.1-5b and 5.1-7b. Not visible in this view, because of the steeply descending topography immediately west of Manzanita Drive, an additional existing project structure within view of several residences in close proximity to project ROW along Manzanita Drive to the west also will be removed. Comparing the existing view and post-project simulation demonstrates that the removal of project structures will represent a noticeable reduction in visual dominance of the project and an improvement to the character of the landscape viewed by residents and visitors at this location. In the Central Landscape Unit, the reconstructed 115 kV alignment extends generally east-west for approximately 2.25 miles, from the summit of the Oakland Hills west of Manzanita Drive to the Park Boulevard/Estates Drive intersection north of Dimond Canyon. Compared with the visual setting in the East Landscape Unit, this area is characterized by undulating to steep terrain with a preponderance of dispersed hillside residences along narrow, winding streets interspersed with public green space/ recreation areas. Within much of this landscape unit, open views toward the project typically are obstructed by a combination of intervening hilly topography as well as mature vegetation along roadways and at residential properties.

Sensitive viewing locations in this landscape unit include scenic roadways and hillside residential communities that come near to the project. Among the former is Skyline Boulevard, an Alameda County scenic roadway that parallels the summit of the Oakland/Berkeley Hills and is crossed by the project. A northbound motorist's perspective depicted on Figure 5.1-7a shows dense stands of mature trees lining the narrow roadway in the foreground, framing an open vista with a partial view of San Francisco Bay in the distance. In the center of the view, an existing project LSP along with an adjacent wood utility pole supporting distribution lines and telecommunication cables is silhouetted prominently against a bright backdrop of sky. The base of these structures lies below the elevation of the roadway shoulder and, to the right, an existing project LST is partially visible perched above the roadway on the steep embankment.

The Figure 5.1-7b simulation shows a taller replacement LSP identical in form to the existing structure and situated somewhat closer to the roadway edge. To the right and above the roadway, the lower portion of a new LSP is visible against a combination of vegetation and sky in the backdrop where it replaces the existing lattice tower. The simulation demonstrates that, although taller than the existing structures, when seen at relatively close range from northbound Skyline Boulevard, vegetation and topography will partially screen open views toward the new structures. The simulation also shows that the currently available open view toward the distant San Francisco Bay will not be obstructed by the project. When seen from greater distances, where open views of individual structures could potentially be available to travelers along both northbound and southbound Skyline Boulevard, the relatively narrow winding roadway will restrict all but fleeting views toward the new project structures. Overall, the introduction of the replacement structures will represent a minor incremental change to the visual setting. Considering the factors outlined previously that will limit project visibility, the project will not substantially alter the existing visual character of the landscape at this location.

Below Skyline Boulevard, the project alignment closely parallels Shepherd Canyon Road for approximately 1.25 miles, in many instances passing within a few hundred feet or less of hillside residences. Approximately 0.6 mile below Skyline Boulevard, Figures 5.1-8a and 5.1-8b show a view looking northeast from a narrow hillside road adjacent to the project ROW that provides access to a group of residences situated approximately 500 feet above Shepherd Canyon Road and approximately 40 feet from the project ROW. Motorists and pedestrians are afforded a relatively unobstructed view toward the project alignment that includes multiple pairs of lattice towers and overhead conductors receding toward the distant summit. In the center of the view, partially screened by vegetation in the foreground, is a wood utility pole supporting power lines and telecommunication cable. To the right are parked cars and fencing that enclose the backs of several residences that overlook Shepherd Canyon, along with dense vegetation that includes mature trees adjacent to the residences.

The Figure 5.1-8b simulation shows two existing LSTs in the foreground replaced with a pair of noticeably taller LSPs approximately 275 feet from the viewpoint, beyond which existing LSTs have been replaced with a pair of slightly taller TSPs and two pairs of LSPs, which are only partially visible because of intervening vegetation and distance from the viewpoint. Given their proximity to the viewpoint and seen in isolation from comparably scaled elements in the foreground landscape, the heightened vertical profile of the replacement structures appears as dominant features in this street view. Because of long-duration views of the project potentially available to nearby residents, visual sensitivity in this location is considered moderate to high. However, given the prevailing orientation of residences closest to the project outward from the project alignment toward Shepherd Canyon, along with the presence of dense surrounding vegetation that in large measure screens views of the project, the degree of visual change associated with the project will not substantially degrade the existing visual character of the landscape as seen from this residential community at this location.

Figures 5.1-9a and 5.1-9b, an existing and a post-project KOP view, shows Thackeray Drive at the intersection of Westover Drive, looking northwest across Shepherd Canyon from the south, affording local motorists and some residents a relatively unobstructed view of the project ROW on the opposite side of the canyon. In the existing view, standing out against a dominant backdrop of dark, mature tree canopies, at approximately 940 feet, a pair of light-colored project LSTs can be seen on the left; somewhat less prominent, appearing behind the rooftop of the residence in the foreground, is a single LSP. The Figure 5.1-9b simulation shows two taller TSPs in place of the existing LSTs and the permanent removal of the LSP. The narrow, linear profile of the TSPs will represent an incremental reduction in visual contrast when compared to the complex angular form of the existing LSTs that have been removed. The increased height of the replacement structures, although potentially discernible, will not extend above the backdrop of mature trees, and therefore will represent an incremental change that will not substantially alter the visual dominance of the project. Due to the long-duration views of the project potentially available to nearby residents, visual sensitivity in this location is considered moderate to high. However, the presence of dense vegetation near most of the residences screens distant views of the landscape to a great extent, including project elements. Additionally, views of the project are seen in the context of electrical infrastructure that include utility poles and overhead conductors that dominate the foreground in this KOP view. Taken together with the permanent removal of the existing interset structure in the center of the view, the modifications will represent a modest incremental change and do not substantially alter the overall character or quality of the landscape at this residential neighborhood location. Figures 5.1-10a and 5.1-10b, an existing and a post-project KOP view, looking north from the Montclair Railroad Trail, a public open space that parallels the west side of Shepherd Canyon. In the existing view the top of a pair of project TSPs can be seen where they appear above dense vegetation that lines the trail. The Figure 5.1-10b simulation depicts the extension of the TSPs height well above the tree canopy. Compared to the existing structures shown on Figure 5.1-10a, the increased height of the modified structures will represent an incremental increase in the visual dominance of the project. However, the proximity of mature trail-side vegetation largely constrains open views within the canyon, and because the visual orientation of trail users is predominantly horizontal, the increased height will potentially not be particularly discernible to most viewers. At the same time, because overall form of the structures will not be substantially altered, the overall visual effect will be modest. The degree of visual change associated with the modification of the project structures will not substantially alter the existing visual character of the landscape at this location.

Figures 5.1-11a and 5.1-11b show a view from a hillside residential area, a portion of which closely parallels the project ROW where it passes through Shepherd Canyon Park. Seen from a residential street looking toward the project alignment, a mix of tall trees and dense lower vegetation surround nearby residential properties. In the foreground, a prominent wood utility pole supports an array of overhead power and telecommunication lines. Near the center of Figure 5.1-7a, two existing LSTs are silhouetted primarily against the sky, while lower portions of the structures are somewhat less noticeable against a backdrop of distant vegetation.

The Figure 5.1-11b simulation depicts two nominally taller LSPs in place of the existing LSTs that have been removed. While the upper sections of the replacement structures do not substantially deviate from the form of the existing structures, their more slender, vertical lower sections subtly reduce the visibility of the new structures when compared with the wider, angular base of the existing LSTs. Although the increased height and altered form of the new project structures will be noticeable, the difference in appearance will be incremental and will not reflect increased visual dominance of the project in this location. Visual sensitivity is considered moderate to high in this location because of the potential long duration views of the project for nearby residents. However, the prevalence of mature vegetation provides substantial screening for most of the nearby residents and, therefore, the visual change will be experienced by a limited number of viewers, who are generally familiar with local power and communication infrastructure that is an established visual feature within the community. In this instance, the replacement of the existing lattice towers with the new lattice poles will represent an incremental change to the visual setting that will not substantially degrade the existing visual character of the landscape as seen from this residential community at this location.

The increased height of new and modified project structures shown on Figures 5.1-10 b and 5.1-11b, permitting greater conductor span-length between structures, will result in the permanent removal of a pair of intermediate structures where the alignment is particularly close to several residences. In a view looking northeast approximately 130 feet to the south of KOP 8, Figures 5.1-12a and 5.1-12b show the project where the alignment passes immediately behind a residence facing the Drake Drive/Magellan Drive intersection. Two project LSTs less than 100 feet from the residence are seen in the existing view. From this street view, the tops of the structures extend noticeably above the rooftop of the residence, affording some residents along Drake Drive and Magellan Drive, as well as motorists and pedestrians, relatively close-range views of the project structures where they appear above the prevalent screening vegetation that otherwise constrain views of the project in this area. In the Figure 5.1-12b simulation, the two LSTs have been permanently removed, representing a substantial reduction of visual dominance of the project at this location. A comparison of the existing view and post-project simulation demonstrates that the permanent removal of project structures will result in an incremental improvement in the character of the landscape seen by nearby residents, motorists, and pedestrians.

In an existing view looking southwest along the project alignment where it crosses SR 13, Figure 5.1-13a is an existing view looking across the highway at a pair of project lattice towers located close to the southbound lanes of this well-travelled regional artery. Seen primarily against a mottled backdrop of dense tree canopy, the structures extend partially above the tree line, where they are prominently silhouetted against the sky, together with a cluster of cellular antennas affixed to the top of the tower on the left. The Figure 5.1-13b simulation shows two taller replacement TSPs approximately 50 feet southwest of the existing tower positions and the removal of the cellular antennas. Compared to the broad, complex form of the existing LSTs, the narrow, linear profile of the new structures are more visually compatible with the numerous wood power poles that can be seen to the left and right of the project structures, which, coupled with the removal of the cellular antennas, represents an incremental reduction in visual contrast exhibited by the project. Although taller than the existing LSTs, when viewed against the uniform sky backdrop the height difference of the replacement structures will not be particularly discernible to sensitive viewers. Dense roadside vegetation and the shifting roadway topography that characterizes the approach to the project crossing in both directions constrain views of the project structures from a distance and, given the near perpendicular view angle toward the project structures at the roadway crossing, motorists are afforded at best a fleeting glimpse of project structures at typical highway speeds. When seen in the context of adjacent electrical infrastructure that includes utility poles and overhead power and telecommunication lines in the immediate vicinity of the project, a comparison between the existing view and post-project simulation demonstrates that the replacement of existing LSTs with taller TSPs will not substantially increase the visual dominance of the project at this location. The visual change will be moderate and will not negatively alter the landscape character at this roadway location.

Figure 5.1-14a is an existing view taken from northbound Park Boulevard showing a motorist's view of the project alignment immediately north of where it crosses the roadway and ascends the largely wooded south slope of Dimond Canyon. Three pairs of LSTs can be seen approximately 800 feet away near the top of the canyon, beyond a clearing within the otherwise densely vegetated terrain in view from the roadway. The Figure 5.1-14b simulation shows three pairs of somewhat taller LSPs having replaced the existing LSTs at approximately the same locations. Visible against the uniform sky backdrop, the increased height of the new structures is not particularly discernable. When compared to the existing structures, the difference is incremental and will not substantially increase the visual dominance of the project as seen in this view. Visual sensitivity in this location is considered moderate and, given the elevated angle of view of the project coupled with the winding roadway segment at this viewpoint that draws attention of northbound drivers away from the project elements, affords fleeting views of the project for motorists and bicyclists who constitute most of the viewers. Seen in the context of existing adjacent electrical infrastructure that includes roadside utility poles and overhead power and telecommunication lines in the immediate vicinity along Park Boulevard, a comparison between the existing view and post-project simulation demonstrates that the level of visual change will be moderate and incremental and will not substantially alter the overall landscape character at this scenic roadway location.

The West Landscape Unit is the relatively dense residential corridor that roughly parallels Park Boulevard to the north between Estates Drive and I-580 to the west. Compared to the visual setting in the Central Landscape Unit, this unit includes considerably more visible existing electrical utility infrastructure in the landscape because of the relatively smaller scale and more limited distribution of mature vegetation within the area. As illustrated on Figures 5.1-2h through 5.1-2l, Representative Photographs 15 through 20, residents, motorists, and pedestrians near the project alignment within this landscape unit are afforded relatively unobstructed views toward existing project structures.

Figure 5.1-15a shows a close-range view of existing project elements from Estates Drive, a well-used residential road north of Park Boulevard. Seen from approximately 190 feet away, the upper parts of two adjacent LSTs are in the center of the view, beyond a stand of low trees, parked vehicles, and an array of wood utility poles supporting overhead power and telecommunication lines. Silhouetted against the light sky backdrop, the complex geometric form of the towers, along with numerous cellular antennas mounted to the closer structure, is a dominant landscape feature at this location.

The Figure 5.1-15b simulation shows new tubular steel riser poles where the project overhead 115 kV circuits are relocated underground. Two new taller riser poles are located adjacent to where the LSTs have been removed. The simulation also shows the removal of two trees located on Estates Drive in conjunction with the project. On the left, two additional new riser poles are located to the southwest along Park Boulevard at the end of Estates Drive, approximately 450 feet from the viewpoint. From this viewpoint, the introduction of four new structures, only the tops of which are visible beyond the trees, in place of the two existing LSTs represents an increase in visual contrast, which results in part from the unusual appearance of the conduit and insulator configuration. At the same time, although taller, the slender, more linear appearance of the riser poles represents an incremental change that is compatible in scale and form with existing roadside utility infrastructure seen in this location. The overall visual sensitivity at this location is considered moderate to high because of its location in a residential neighborhood and its proximity to a nearby church and school, whose occupants will nevertheless be familiar with the surrounding environment of roadway and electrical utility infrastructure. The visual change also will be noticeable to motorists along Estates Drive and Park Boulevard, although views of project elements generally will be fleeting. A comparison between the existing view and post-project simulation demonstrates that, overall, the level of visual change resulting from the removal of the existing project lattice towers and the introduction of riser poles will not substantially degrade the existing visual character of the landscape at this location.

As previously noted, the relocation of a 1.2-mile segment of the project alignment underground along Park Boulevard to Oakland X Substation will result in the permanent removal of 16 power line structures along the existing ROW between Estates Drive and Oakland X Substation. The structure removals include locations where the existing project ROW currently crosses dense residential neighborhoods and affords close-range views of project structures. Figures 5.1-16a and 5.1-16b, existing and post-project KOP views, show an open view of the project taken from Hollywood Avenue, a residential street extending off Park Boulevard less than 0.25 mile southwest of the Estates Drive/Park Boulevard intersection. Seen from approximately 320 feet away in the existing view are two prominent LSTs, situated side by side on a barren knoll at the end of the street, where they extend well above the distant tree canopy and constitute dominant elements in the view. The Figure 5.1-16b simulation demonstrates that the removal of project structures substantially reduces the overall visual dominance of power line infrastructure at this location and will represent a noticeable incremental reduction of visual contrast, leading to an overall improvement to the landscape character within this residential neighborhood.

Farther to the southwest, the existing project ROW generally runs parallel to the street grid, with the alignment in some cases passing directly over residential properties, as shown on Figures 5.1-17a and 5.1-17b, an existing and post-project KOP view looking northeast from Holman Road near the project terminus at Oakland X Substation. The existing view shows two project LSTs situated on a project easement directly behind a residence facing the Bates Road/Holman Road intersection. Seen at approximately 190 feet, the existing project LSTs are dominant visual elements in this view. The removal of the LSTs, as documented on the Figure 5.1-17b simulation, will eliminate project dominance and substantially reduce the level of visual contrast in the landscape as seen from this roadway intersection and nearby residences, resulting in a noticeable improvement to the landscape character at this residential location.

The construction of the underground project segment along Park Boulevard will result in nominal permanent visual change with the installation of vault covers in the street pavement. These will be seen in the context of similar existing infrastructure.

As discussed in detail previously and demonstrated by the set of visual simulations from KOPs presented on Figures 5.1-3a and 5.1-3b through Figures 5.1-17a and 5.1-17b, while the construction of the PG&E project will result in temporary visual changes that will be noticeable to varying degrees, the overall effects of the PG&E project will not substantially degrade the existing visual character of the landscape setting. Moreover, with the permanent removal of approximately 16 lattice towers along the original project ROW between Oakland X Substation and Park Boulevard/Estates Drive as a result of relocating a portion of the existing 115 kV power alignment underground, the degree of visual contrast attributed to the project will be incrementally lessened and the impacts will be less than significant.

Operation and Maintenance Impacts

O&M activities along the rebuilt power lines will be generally the same as O&M on the existing lines and will consist of routine inspection, repair, and maintenance activities, including current ongoing vegetation management programs. Along the rebuilt overhead portion of the project alignment, typically no operations and maintenance inspections are conducted for the first 5 years following the in-service date. After 5 years, inspections are performed annually by either vehicle or helicopter and will be conducted as they are under existing conditions.

The new underground portion of the project alignment typically will require routine quarterly inspections of terminal structures, with biannual inspections of underground lines and vaults. Routine inspections and emergency repair of these components will require the periodic short-term use of vehicles and equipment that could be visible to the public along Park Boulevard and to attendees at the Corpus Christi Church and School, where these activities occur within the adjacent PG&E easement. Overall, these activities will represent an incremental addition to the anticipated routine project operations and maintenance activities. Given the expected duration and the limited number of affected viewers, these short-term activities will not be inconsistent with other periodic local activity and will not substantially degrade the existing visual character of the landscape. Therefore, new project operation and maintenance impacts will be less than significant.

As stated previously, the PG&E project components will not be subject to local discretionary land use or planning regulations. As shown in Table 5.1-4, the portions of the project in urbanized areas will not conflict with applicable zoning and other regulations governing scenic quality.

Table 5.1-4. Consistency with Local Scenic Quality Regulations

Regulatory Provision	Consistency
***City of Orinda General Plan*, Conservation Element** Policy 5-47. Scenic corridors shall be maintained with the intent of protecting attractive natural qualities adjacent to various roads throughout the county. Policy 4.1.1 N. Encourage undergrounding of power lines and replacement of utility towers with single poles.	Yes. Project power line components will be replaced in kind in Orinda and will not alter distant views of the overall surrounding area. The project is consistent with the City of Orinda General Plan policies.
***Contra Costa County General Plan,* Transportation and Circulation Element** Policy 5-47. Scenic corridors shall be maintained with the intent of protecting attractive natural qualities adjacent to various roads throughout the county. Policy 5-49. Scenic views observable from scenic routes shall be conserved, enhanced, and protected to the extent possible. Policy 5-51. Multiple recreation use, including trails, observation points, and picnicking spots, where appropriate, shall be encouraged along scenic routes. Policy 5-55. Provide special protection for natural topographic features, aesthetic views, vistas, hills, and prominent ridgelines at "gateway" sections of scenic routes. Such "gateways" are located at unique transition points in topography or land use and serve as entrances to regions of the County. Goal 9-A. To preserve and protect the ecological, scenic, cultural/historic, and recreational resource lands of the County. Goal 9-E. To protect major scenic ridges, to the extent practical, from structures, roadways, and other activities which would harm their scenic qualities.	Yes. Although visual modifications to the landscape will be experienced to varying degrees by residents, motorists, bicyclists, and recreation visitors, temporary and permanent visual change resulting from replacement of the existing PG&E alignment will not substantially alter or degrade the existing visual character of the landscape within the project area, as demonstrated from the visual simulations. The Project is consistent with the *Contra Costa County General Plan*, Transportation and Circulation Element policies and goals.
East Bay Watershed Master Plan USL.17 – Prohibit management practices or development proposals that would require large-scale modification of the Upper San Leandro Reservoir watershed landscape, especially in areas that are highly visible from Redwood Road, Anthony Chabot Regional Park, and other public viewpoints.	Yes. The project proposes to upgrade and replace existing power lines. The upgrades to the existing power lines are not considered a large-scale modification. In addition, Redwood Road, Anthony Chabot Regional Park, and other public viewpoints near the Upper San Leandro Reservoir watershed landscape are not near or within the project. Therefore, there will be no visual impacts to the viewpoints. The project is consistent with the *East Bay Watershed Master Plan* policy.
East Bay Regional Park District Master Plan PRPT 28: The District will work in cooperation with the utility companies to place existing overhead utilities underground (unless so doing conflicts with applicable codes) as soon as practical and will work with other agencies to reduce visual impacts on adjacent lands. The District will seek to avoid the construction of high voltage power lines within the parklands, particularly in… preserve areas. PRPT 29: The District will keep its lands, including all ridges and peaks, free of additional communication facilities in order to maintain open viewshed, natural conditions, and public use as well as to limit vehicular and service activities.	Yes. Aboveground project replacement structures will be largely imperceptible because of distance and urban backdrop conditions. Although visual modifications to the landscape will be experienced to varying degrees by park users, temporary and permanent visual change resulting from replacement of the existing PG&E alignment will not substantially alter or degrade the existing visual character of the landscape within the project area, as demonstrated from the visual simulations. The project is consistent with the *East Bay Regional Park Master Plan*.

Table 5.1-4. Consistency with Local Scenic Quality Regulations

Regulatory Provision	Consistency
***Alameda County General Plan,* Scenic Route Element** The plan objectives include to conserve, enhance, and protect scenic views observable from scenic routes. The project intersects or comes near to the following County scenic routes: Skyline Boulevard – crossed by the project Warren Freeway (SR 13) – crossed by the project Park Boulevard – crossed by the project I-580 – passes approximately 600 feet west of Oakland X Substation, but the power lines generally are not visible	Yes. Some of the power line replacement structures will potentially be visible from Alameda County scenic routes in the project area such as Skyline Boulevard, Warren Freeway (SR 13), Park Boulevard, and I-580. As demonstrated in the visual simulations, project-related change will not substantially affect the view from Skyline Boulevard. Although open views of project components will be visible from more urban locations, these will be seen in the context of existing utility lines and related infrastructure that align these roadways. In the case of the Warren Freeway (SR 13), affected views of the project alignment will be fleeting given typical highway speeds along this stretch of roadway. Because of this, the project will not have a substantial effect on views from local scenic roadways in the project area. The project is consistent with the Alameda County General Plan, Scenic Route Element.
***City of Oakland General Plan,* Scenic Highways Element and Open Space Conservation and Recreation Element** The Scenic Highways Element (Oakland 1974) addresses the preservation and enhancement of those distinctly attractive roadways that traverse the city and the visual corridors that surround them. Both Skyline Boulevard and I-580 are designated as scenic routes. The Open Space Conservation and Recreation Element (Oakland 1996) contains provisions for protecting and enhancing visual resources in the city, including the following. POLICY OS-10.1 VIEW PROTECTION: Protect the character of existing scenic views in Oakland, paying particular attention to: (a) views of the Oakland Hills from the flatlands; (b) views of downtown and Lake Merritt; (c) views of the shoreline; and (d) panoramic views from Skyline Boulevard, Grizzly Peak Road, and other hillside locations. (p. 2-65)	Yes. As demonstrated in the visual simulations, project-related change will not substantially affect the view from Skyline Boulevard. Although open views of project components will be visible from more urban locations, these will be seen in the context of existing utility lines and related infrastructure that align these roadways. With the permanent removal of several lattice towers along the project ROW, the degree of visual contrast attributed will be incrementally lessened. Aboveground project replacement structures east of the transition at Estates Drive and Park Boulevard will be largely imperceptible from the flatlands because of distance and urban backdrop conditions. PG&E Oakland X Substation could be seen from a small section of I-580, which passes approximately 600 feet west of the substation. Modifications to Oakland X Substation will not be visible from outside the substation. One of three new riser poles that will connect the underground portion to Oakland X Substation and the removal of existing power lines and towers could potentially be visible to motorists from I-580 at the Park Boulevard under crossing, where dense vegetation lining the freeway embankment gives way to an open view of the substation uphill project alignment. However, given the perpendicular motorist's view angle and given typical roadway velocity at this location, visibility will be fleeting, and the riser poles will be seen in the context of other utility infrastructure, including light standards of similar form. The project is consistent with the *City of Oakland General Plan*, Scenic Highways Element and Open Space Conservation and Recreation Element policies.

Table 5.1-4. Consistency with Local Scenic Quality Regulations

Regulatory Provision	Consistency
City of Piedmont General Plan Goal 27: City Identity and Aesthetics. Ensure that streets, parks, civic buildings, and other aspects of the "public realm" contribute to Piedmont's overall identity, beauty, and visual quality. Policy 27.3: View Preservation. Recognize and protect significant views in the city, particularly Piedmont's characteristic views of the San Francisco and Oakland skylines, Lake Merritt and San Francisco Bay, the Bay and Golden Gate Bridges, and surrounding hills, canyons, and geological features. Discourage the obstruction of such views by upper level additions, tall structures, and devices such as communication towers. Similarly, tree planting should avoid species or locations that will lead to the obstruction of desirable views. Policy 27.8: Utility Undergrounding. Support neighborhood efforts to underground utilities throughout Piedmont, with due consideration given to the level of community support and the financial impacts on the City and its residents. Underground utilities shall be required for any new subdivision.	Yes. The replacement project alignment will transition underground beginning approximately 1.2 miles east of Oakland X Substation and existing aboveground structures on this part of the alignment will be eliminated from local views. New riser poles near Estates Drive and Park Boulevard, where the lines transition to underground, will be seen in the context of other utility infrastructure, including light standards of similar form. Aboveground project replacement structures will be largely imperceptible from Piedmont because of distance and urban backdrop conditions. Although visual modifications to the landscape will be experienced to varying degrees by residents, motorists, bicyclists, and recreation visitors, temporary and permanent visual change resulting from replacement of the existing PG&E alignment will not substantially alter or degrade the existing visual character of the landscape within the project area, as demonstrated from the visual simulations. The project is consistent with the City of Piedmont General Plan goal and policies.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? *Less-than-Significant Impact.*

Glare exists when a high degree of contrast between bright and dark areas in a field of view makes 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. APM AES-2, which calls for the use of a dulled galvanized or Corten finish on replacement structures and non-specular conductors, will minimize the potential effect of glare.

Temporary Construction Impacts

The project is predominantly situated in a setting where lighting sources tend to be localized and associated with residences and roadways. Street lighting is widespread in the area, and includes some traffic signals, especially along Park Boulevard west of the Estates Drive intersection. Although project construction is expected to occur mostly during daylight hours, nighttime work may be necessary that will require limited temporary lighting at some work areas. In addition, for the duration of construction, staging yards are expected to use nighttime security lighting. Given the limited amount of night light sources in portions of the project area, construction lighting used along the project alignment may create a new source of substantial temporary light, particularly in areas east of the Oakland Hills summit. As specified in APM AES-1, these lighting sources will be directed onsite and away from potentially sensitive receptors. Therefore, impacts will be less than significant.

Permanent Construction Impacts

No new lighting is proposed along the rebuilt power lines or within Moraga and Oakland X substations; therefore, there will be no permanent lighting impacts. The FAA screening tool was used to review the rebuilt power lines at 60 percent design. A determination of no hazard to air navigation was provided by the FAA for all structures screened. Supporting documentation is provided in Appendix H2, FAA Notice and Criteria Tool Results.

Glare from new project replacement structures and conductors has the potential for impact in some locations, particularly at roadway crossings and near residences. Use of non-specular conductors and a dulled galvanized finish on the new project poles will reduce potential glare of power line components. New project components adjacent to Oakland X Substation (riser poles and associated conduits and insulators) will be a nonreflective neutral gray color and galvanized steel structures will weather to a dull, nonreflective patina and will minimize the potential effect of glare. Potential impacts from glare will be less than significant.

Operation and Maintenance Impacts

While nighttime operation and maintenance work for the project is not planned, it may occur on an emergency basis as needed. Nighttime lighting for work will be infrequent if it occurs. The additional lighting will be temporary and represent a minor incremental change to existing nighttime lighting conditions within the project area. The impact will be less than significant.

5.2 Agriculture and Forestry Resources

This section describes existing conditions and potential impacts on agriculture and forestry resources as a result of construction, operation, and maintenance of the project. The analysis concludes that impacts on agriculture and forestry resources will be less than significant. The APM described in Section 5.2.4.2 will further reduce the project's less-than-significant impacts. The project's potential effects on agriculture and forestry resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.2-1 and discussed in more detail in Section 5.2.4.

5.2.1 Methodology and Environmental Setting

5.2.1.1 Methodology

Various sources were consulted to complete the analysis for agriculture and forestry resources, including the California Department of Conservation (DOC) Farmland Mapping & Monitoring Program (FMMP) data and maps; Williamson Act contract maps; aerial photographs; County and city general plans, zoning ordinances, and maps; and environmental impact reports for other projects in the area (DOC 2023). The mapped agricultural and forestry designations and contracted lands were compared with the project area. This section provides a qualitative analysis to determine whether the project will have a substantial impact on important farmland or forest land. In addition, field visits to the site were conducted to gather relevant information pertaining to the land uses at the project site and surrounding areas.

5.2.1.2 Environmental Setting

The East Bay hills define most of the project area; the topography is flatter at the western end of the project area. The project vicinity includes dense urban development with residential, commercial, industrial, and institutional uses; moderately dense housing in the hills; and a range of local and regional parks and open spaces, especially in the eastern section of the project. In addition to the East Bay hills, major geographic features in the project vicinity include EBRPD Sibley Volcanic Regional Preserve, EBRPD Huckleberry Botanic Regional Preserve, Sausal Creek in the City of Oakland Dimond Park, and Shephard Creek in the City of Oakland Shepherd Canyon Park. Elevation ranges from approximately 140 feet above sea level at the western end of the project, to approximately 1,370 feet above sea level in the central and eastern sections of the project, to approximately 650 feet above sea level at the eastern end of the project.

Existing predominant agricultural use in the project area is seasonal cattle grazing, approximately November through May, in EBRPD Sibley Volcanic Regional Preserve in the eastern portion of the project (EBRPD 2024). Refer to Figure 5.11-1.

5.2.1.3 Agricultural Resources

Agricultural land is designated by the DOC under the Division of Land Resource Protection, identified in the 2018 FMMP, and defined by CEQA. The FMMP produces Important Farmland Maps, which combine soil quality, available irrigation, and land use information (DOC 2023).

"Agricultural land" is defined by California PRC Section 21060.1 as land that qualifies as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, defined as follows:

- Prime Farmland has the best combination of physical and chemical characteristics able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
- Unique Farmland consists of lesser-quality soils, but produces the state's leading agricultural crops. This land is usually irrigated, but it includes nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the 4 years prior to the mapping date.
- Farmland of Statewide Importance is similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.

Additional categories, including Farmland of Local Importance, Grazing Land, Urban and Built-up Land, and Other Land, are identified within Important Farmland Maps. The Rural Land Mapping Project provides more detail on the distribution of various land uses within the Other Land category in the FMMP counties, including Alameda and Contra Costa Counties. For the purposes of this PEA, Important Farmland is defined consistent with the California PRC Section 21060.1 definition of "agricultural land," as well as the CEQA Environmental Checklist Form (Appendix G of the CEQA Guidelines), and includes areas designated as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance.

Important Farmland

According to the FMMP, all land in the project area is Grazing Land, Urban and Built-up Land, and Other Land. No areas are designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (DOC 2023). In addition, the project area does not contain Farmland of Local Importance (DOC 2018).

Williamson Act Contracts

The project area does not contain any areas under Williamson Act contracts (DOC 2023).

Agricultural-Related General Plan Land Use and Zoning Designations

Public utility facilities regulated by the CPUC, such as PG&E, are not subject to local land use and zoning regulations. However, the agricultural-related General Plan land use and zoning designations for land on which the proposed project is located are included for informational purposes.

A general plan establishes a broad range of land use designations for planned land uses and identifies appropriate development guidelines for each designation. General plan designations usually are broader than zoning designations; however, both designations typically are aligned. General plan land use and zoning designations are designed to protect and conserve the value of land use.

The project site in unincorporated Contra Costa County is in an area zoned General Agriculture A-2 (Contra Costa County 2023). It allows all types of agriculture, including general farming and livestock production. The *Contra Costa County General Plan* land use designations corresponding to the project area are Parks and Recreation, Watershed, and Agricultural Lands (Contra Costa County 2005).

The proposed project does not intersect agricultural land use or zoning designations in the City of Orinda, although Orinda has nonagricultural zoning classifications, including the Public, Semipublic, and Utility District zoning, in the project area that allow for limited animal husbandry and crop production, in most cases subject to a use permit (City of Orinda 2022), which does not apply to the project.

Piedmont has no agricultural land use or zoning classifications, and agricultural uses are not listed as allowed uses under any zoning classification (City of Piedmont 2020, 2023).

The proposed project does not intersect agricultural land use or zoning designations in the City of Oakland (City of Oakland 2022, 2023), although Oakland has nonagricultural zoning classifications in the project area that allow for some limited urban agricultural and community gardening. These include areas zoned for Detached Unit Residential (RD) and Hillside Residential (RH) and Mixed Housing Type Residential (RM) (City of Oakland 2022).

5.2.1.4 Forestry Resources

The project passes through open space (East Bay Municipal Utility District [EBMUD] land, EBRPD Sibley Volcanic Regional Preserve, EBRPD Huckleberry Botanic Regional Preserve) in Contra Costa County, and parkland in the City of Oakland that may support more than 10 percent native tree cover and therefore may be considered as forest land. Refer to Figure 5.4-2 in Section 5.4, Biological Resources, to review vegetation communities along the project, including areas that may be considered forest land. As noted in Table 5.4-2 in Section 5.4, Biological Resources, the botanical resources field survey area contains approximately 1.1 acres of Upland Redwood Forest, 3.2 acres of California Bay Forest, and 67.5 acres of Coast Live Oak Woodland that may be affected by the project. There is no land in the project area that is categorized as timberland or is used for timber harvesting per Section 4526 of the PRC or Section51104(g) of the California Government Code.

5.2.2 Regulatory Setting

5.2.2.1 Federal

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

5.2.2.2 State

Farmland Mapping and Monitoring Program

The California DOC, under the Division of Land Resource Protection, has established the FMMP to monitor the conversion of the state's farmland to and from agricultural use (DOC 2023). The goal of the FMMP is to provide consistent and impartial data to decision makers for use in assessing status, reviewing trends, and planning for the future of California's agricultural land resources. The FMMP maps agriculturally viable lands and designates specific categories.

California Public Resources Code

Section 12220(g) of the California PRC defines forest land, which may occur in the project footprint. Definitions of "forest land" and "timberland" per the California PRC are as follows.

- 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. Timberland Production Zone is land that can be used for growing and harvesting timber and for compatible uses.

In addition, California Government Code Section 51104(g) defines "Timberland Production" zones as areas that have been zoned pursuant to Section 51112 or 51113 and are devoted to and used for growing and harvesting timber, as well as compatible uses such as electric transmission facilities and management of fish and wildlife habitat.

5.2.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process. Agriculture-related general plan and zoning designations are described in Section 5.2.1.3.3. Refer to Section 5.11, Land Use, for a detailed discussion on general plan land use and zoning designations.

East Bay Municipal Utility District Watershed Plan

Many of the EBMUD lands have been grazed by livestock for many years to prevent brush encroachment, reduce fire hazard, provide leasing revenue to the district, and increase runoff into EBMUD reservoirs. The *East Bay Watershed Master Plan* sets objectives and management guidelines (including livestock grazing guidelines) that apply to all the EBMUD lands to help manage the district natural resources (EBMUD 2018).

East Bay Regional Park District Master Plan 2013

EBRPD manages regional parks in Alameda and Contra Costa counties. The *East Bay Regional Park District Master Plan* contains policies and guidelines to achieve its standards in resource conservation and management. EBRPD aims to protect and enhance its biological resources by allowing managed conservation grazing in regional parks where opportunity for livestock grazing exists (EBRPD 2013).

5.2.3 Impact Questions

The project's potential effects on agriculture and forestry resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.2-1 and discussed in more detail in Section 5.2.4.

Table 5.2-1. 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 nonagricultural land?	☐	☐	☐	☒
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 by 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 uses?	☐	☐	☒	☐
e) Involve other changes in the existing environment, which, due to their location or nature, could result in the conversion of farmland to nonagricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

5.2.3.1 Additional CEQA Impact Questions

None.

5.2.4 Potential Impact Analysis

Project impacts related to agriculture and forestry resources were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.2.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project-related impacts on agricultural and forest resources were evaluated for each of the criteria listed in Table 5.2-1, as discussed in Section 5.2.4.

5.2.4.2 Applicant-Proposed Measures

The project will have less-than-significant impacts on agriculture and forestry resources. Implementation of APM AGR-1 will further minimize potential impacts.

APM AGR-1: Minimize Impacts on Active Agricultural Areas.

- Prior to construction, PG&E will provide written notice to agricultural landowners outlining construction activities, preliminary schedule, and timing of restoration efforts.
- PG&E will coordinate with landowners to minimize construction-related disruptions to grazing operations. To the extent reasonably feasible, PG&E will schedule construction activities to minimize disruptions to grazing.
- PG&E will restore grazing land temporarily impacted by construction to preproject conditions following completion of construction, including areas impacted by establishment of temporary staging, laydown and storage areas, overland access, guard structures, and pull sites. The responsibility of performing these various tasks may be stipulated in an agreement between PG&E and the landowner.

5.2.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

e) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP, to nonagricultural use? No Impact.

Because none the project is located on land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, there will be no conversion of or impact to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use. Project operation and maintenance activities also will not be located on, covert to nonagricultural use, or impact Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

f) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract? No Impact.

During construction, project activities associated with replacing the existing lines will occur in an area currently used for grazing. The project traverses land zoned as General Agriculture (A-2) in unincorporated Contra Costa County. However, the rebuilt structures will occupy a very small area that replaces the existing structure footprint area. Approximately one H-frame wood pole will be removed and not replaced. Approximately four lattice steel towers will be replaced with four new structures in the unincorporated areas of Contra Costa County where grazing may occur. In addition, the foundations of the replaced structures will be removed to approximately 3 feet below the ground surface where feasible and at the discretion of the landowner. The rebuilt lines will not obstruct or preclude the ongoing grazing activities. Implementation of APM AGR-1 as part of project planning, will coordinate construction related activities with grazing operations to avoid unplanned disruption where feasible in addition to restoring work areas or overland access as agreed upon with the landowner. No conflict with existing agricultural zoning will occur. No impact will occur during construction, operation, or maintenance of the project.

The project is not located on any lands under Williamson Act contracts.

g) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? No Impact.

The project is not located in any areas zoned as forest land; refer to Table 5.11-1 in Section 5.11, Land Use. In addition, the project is not located in timberland as defined by PRC 4526 or Timberland Production zoning per California Government Code Section 51104(g). Therefore, no impact will occur.

h) Would the project result in the loss of forest land or conversion of forest land to non-forest use? Less-than-Significant Impact.

The project runs through areas of forest land as defined by PRC Section 12220(g) within regional parks/open space in unincorporated Contra Costa County and parkland in the City of Oakland. A total of up to approximately 350 trees may be trimmed or removed during project construction primarily to provide access to some work areas or to allow equipment to operate within a work area. The potentially impacted trees are located throughout the project route along both the southern and northern lines and tree removal will not be focused in a specific area. In addition, many of these are landscape trees in urban areas. The small number of trees that will be affected at any specific location will not result in the native cover of the forest lands to fall below the 10 percent density threshold loss of forest land or conversion of forest land to non-forest use and thus there will be no loss of forest land. In addition, no forest lands will be converted to non-forest land as a result of construction. Impacts will be less than significant.

Operation and maintenance of the project components will not convert forest land. No impact will occur during operation or maintenance of the project.

i) Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use? No Impact.

Implementation of the project will not involve changes in the existing environment or discourage the continued use of adjacent land for agricultural use, including grazing. The project will not induce growth that will result in the conversion of Important Farmland to nonagricultural use or forest lands to non-forest use; therefore, there will be no impact.

5.3 Air Quality

This section discusses potential air quality issues associated with the project construction, operation, and maintenance, including both regional and site-specific concerns. Air quality emissions will occur within the San Francisco Bay Area Air Basin (SFBAAB) under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). This air quality impact assessment follows Appendix G of the CEQA Guidelines and BAAQMD's CEQA Air Quality Guidelines (BAAQMD 2023) for activities within its jurisdiction.

Primary air emissions from construction of the project include emissions associated with fugitive dust, heavy construction equipment, portable generators, helicopter usage, material and equipment transport trucks, vendor delivery trucks, construction support vehicles, and construction workers commuting to and from the project site. Existing operation and maintenance activities will continue for the project and no increase in air emissions will occur.

Air emissions evaluated include reactive organic gases (ROG), carbon monoxide (CO), nitrogen oxides (NOx), particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), and sulfur dioxide (SO_2). Greenhouse gas (GHG) emissions are discussed separately in Section 5.8, Greenhouse Gas Emissions. The analysis concludes that impacts to air quality will be less than significant with incorporation of the APMs described in Section 5.3.4.2.

5.3.1 Methodology and Environmental Setting

5.3.1.1 Methodology

Short-term construction emissions of ROG, CO, NOx, PM_{10}, $PM_{2.5}$, and SO_2 were evaluated. Construction emissions from off-road construction equipment, portable generators, and fugitive dust were estimated using the methodologies and emission factors described in the California Emissions Estimator Model (CalEEMod) User's Guide (ICF 2022). On-road vehicle emissions were estimated using the methodologies described in the CalEEMod User's Guide (ICF 2022) and emission factors were obtained from the EMFAC2021 emissions model (CARB 2024a). Helicopter emissions were estimated using emission factors obtained from the Swiss Federal Office of Civil Aviation (Rindlisbacher and Chabbey 2015). Projected construction emissions were estimated for each year based on the anticipated project schedule and activities at each of the project construction sites. Although most construction activities were evaluated as occurring in 2027, construction emission estimates were developed using equipment and vehicle emission factors for calendar year 2026 fleet, which is the year in which construction was expected to begin at the time of this evaluation. After this evaluation completed, the anticipated construction schedule moved to start in 2028. Even with the construction start moving forward in time, this approach provides for a more conservative emissions estimate as equipment and vehicle emission factors are expected to improve each year based on developments in control technologies and the required use of cleaner equipment and vehicles over time. Detailed construction emission calculations are presented in Appendix A, including the assumptions employed.

Because the project involves the rebuilding of existing infrastructure, there will be no change to current operation and maintenance activities or associated long-term air emissions as a result of this project. For this reason, air emissions associated with operation and maintenance activities were not quantified.

5.3.1.2 Environmental Setting

The project will be in the City of Orinda, unincorporated areas of Contra Costa County, and the cities of Oakland and Piedmont within Alameda County, all of which lie within the SFBAAB. SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Coast Range splits, resulting in a western coast gap (the Golden

Gate) and an eastern coast gap (the Carquinez Strait), both of which allow air to flow in and out of the SFBAAB and the Central Valley (BAAQMD 2017b).

The climate in the SFBAAB is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell. During the summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface because of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band, resulting in condensation and the presence of fog and stratus clouds along the Northern California coast. In the winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in an overall low air pollution potential (BAAQMD 2017b).

The SFBAAB is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly from one part of the SFBAAB to another, even within short distances. In general, total annual rainfall can reach 40 inches in the mountains but is often less than 16 inches in sheltered valleys (BAAQMD 2017b).

5.3.1.3 Ambient Air Quality

The California Air Resources Board (CARB) maintains ambient air monitoring stations for criteria pollutants throughout California. The air monitoring station closest to the project area is on 21st Street in Oakland. Data from this location were used in this study for ozone (O_3), CO, nitrogen dioxide (NO_2), and $PM_{2.5}$. Because the Oakland location does not monitor for PM_{10}, these data were taken instead from the air monitoring station located on Rumrill Boulevard in San Pablo. This site was conservatively used based on its proximity and similar orientation as the Oakland location with the Diablo Mountain Range to the east and the San Francisco Bay to the west. Table 5.3-1 summarizes available data from these air monitoring stations during the last 3 years (2020 to 2022). As shown, multiple exceedances of the particulate matter National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) have been recorded recently.

Table 5.3-1. Ambient Criteria Pollutants Concentration Data in Oakland and San Pablo

Pollutant	Metric	Maximum Concentrations and Frequencies of Exceeded Standards		
		2020	2021	2022
O_3[a]	Maximum 1-Hour Concentration (ppm)	0.084	0.067	0.054
	Days > 0.090 ppm (CAAQS)	0	0	0
	Maximum 8-Hour Concentration (ppm)	0.056	0.046	0.041
	Days > 0.070 ppm (NAAQS/CAAQS)	0	0	0
CO[a]	Maximum 1-Hour Concentration (ppm)	3.2	2.3	2.2
	Days > 35 ppm (NAAQS)	0	0	0
	Days > 20 ppm (CAAQS)	No data	No data	No data
	Maximum 8-Hour Concentration (ppm)	2.7	1.8	1.8
	Days > 9.0 ppm (NAAQS/CAAQS)	0	0	0
NO_2[a]	Maximum 1-Hour Concentration (ppm)	0.048	0.050	0.044
	Days > 0.18 ppm (CAAQS)	0	0	0
	Days > 0.10 ppm (NAAQS)	0	0	0
	Annual Average Concentration (ppm)	0.011	0.009	0.011
	Days > 0.030 ppm (CAAQS)	No data	No data	No data

Table 5.3-1. Ambient Criteria Pollutants Concentration Data in Oakland and San Pablo

Pollutant	Metric	Maximum Concentrations and Frequencies of Exceeded Standards		
		2020	2021	2022
PM_{10}[b]	Maximum 24-Hour Concentration ($\mu g/m^3$)	114	37	42
	Days > 50 $\mu g/m^3$ (CAAQS)	1	0	0
	Days > 150 $\mu g/m^3$ (NAAQS)	0	0	0
	Annual Average Concentration ($\mu g/m^3$)	20.7	19	20.8
	Days > 20 $\mu g/m^3$ (CAAQS)	No data	No data	No data
$PM_{2.5}$[a]	Maximum 24-Hour Concentration ($\mu g/m^3$)	159.7	25.4	33.8
	Days > 35 $\mu g/m^3$ (NAAQS)	8	0	0
	Annual Average Concentration ($\mu g/m^3$)	10.3	7.5	8.1
	Days > 12 $\mu g/m^3$ (NAAQS/CAAQS)[c]	No data	No data	No data

Sources: CARB 2024c; EPA 2024b

[a] Data from the monitoring station located at 1100 21st Street in Oakland, CA (CARB#:60349).

[b] Data from the monitoring station located at 1865 Rumrill Boulevard in San Pablo, CA (CARB#:07447).

[c] Data are presented for comparison to the NAAQS available at the time monitoring data were collected, and not the new, lower standard of 9 $\mu g/m^3$, which took effect on May 6, 2024.

> = greater than
$\mu g/m^3$ = microgram(s) per cubic meter
ppm = parts per million (by volume)

The U.S. Environmental Protection Agency (EPA) classifies areas as being in attainment or nonattainment with the NAAQS for each criteria pollutant. A region that meets the NAAQS for a pollutant is designated as being in attainment for that pollutant. A region that does not meet the NAAQS for a pollutant is designated as being in nonattainment for that pollutant. An area that was previously designated as a nonattainment area but has met the standard and has been reclassified by EPA as in attainment with a maintenance plan is a maintenance area.

Attainment status for the project area is summarized in Table 5.3-2. Under the NAAQS, the project area is currently designated as nonattainment for the O_3 and $PM_{2.5}$ standards, as maintenance for the CO standard, and as attainment or unclassified for the PM_{10}, NO_2, SO_2, and lead standards. Under the CAAQS, the project area is currently designated as nonattainment for the O_3, PM_{10}, and $PM_{2.5}$ standards and as attainment or unclassified for all other pollutant standards.

Table 5.3-2. Attainment Status for the Project Area

Pollutant	NAAQS	CAAQS
O_3	Nonattainment (Marginal)	Nonattainment
PM_{10}	Attainment/Unclassified	Nonattainment
$PM_{2.5}$	Nonattainment (Moderate)	Nonattainment
CO	Maintenance (Moderate)	Attainment
NO_2	Attainment/Unclassified	Attainment
SO_2	Attainment/Unclassified	Attainment
Lead (particulate)	Attainment/Unclassified	Attainment
Hydrogen Sulfide	No Standard	Unclassified
Sulfates	No Standard	Attainment
Visibility-Reducing Particles	No Standard	Unclassified
Vinyl Chloride	No Standard	No information Available

Sources: CARB 2024b; EPA 2024a

An area that is nonattainment for a particular pollutant and averaging period means that the air quality in that area does not meet the NAAQS and/or CAAQS. As a result, the states are required to submit a State Implementation Plan (SIP) to the EPA detailing how the standards will be attained over time. Thresholds of significance in areas of nonattainment are more stringent than areas of attainment.

5.3.1.4 Sensitive Receptors

Sensitive receptors include hospitals, residences, schools, daycare facilities, elderly housing, convalescent facilities, prisons, dormitories, and parks. These are places where the occupants may be relatively more susceptible to the adverse effects of exposure to toxic air contaminant (TAC) emissions and other pollutants. As described in Chapter 3, Project Description, the project will rebuild infrastructure in the cities of Orinda, Oakland, and Piedmont and, as well as in an unincorporated portion of Contra Costa County. Land uses surrounding the project within cities primarily consist of residential, utility, and resource conservation (parks/open space). Land use surrounding the project features located in unincorporated Contra Costa County is predominantly parks and recreation (open space).

There are more than 4,000 residences, approximately 2 elderly housing facilities, approximately 10 daycare facilities, approximately 10 schools, and approximately 10 parks located within 1,000 feet of the project. Areas of residential sensitive receptors within 1,000 feet of the project are shown on Figure 5.3-1. Table 5.3-3 provides a list of the schools, daycare facilities, elderly housing facilities, and parks located within 1,000 feet of the project. There are no other non-residential receptors, such as hospitals, convalescent facilities, prisons, and dormitories, within 1,000 feet of the project.

Table 5.3-3. Sensitive Receptors –Daycare Facilities, Schools, Elderly Housing, and Parks

Receptor Type	Name	Address
Daycare Facility	Academia de mi Abuela	2162 Mountain Blvd, Oakland
Daycare Facility	Sequoia Nursery School	2666 Mountain Blvd, Oakland
Daycare Facility	KSS Immersion Preschool of Oakland – Lincoln Highlands	2540 Charleston St, Oakland
Daycare Facility	Gan Mah Tov Preschool	3778 Park Blvd, Oakland
Daycare Facility	Duck Pond Preschool	3947 Park Blvd, Oakland
Daycare Facility	Les Petits Francophones	4101 Park Blvd, Oakland
School and Daycare Facility	Joaquin Miller Elementary School	5525 Ascot Dr, Oakland
School and Daycare Facility	Crocker Highlands Elementary School	525 Midcrest Rd, Oakland
School and Daycare Facility	Glenview Elementary School	4215 La Cresta Ave, Oakland
School and Daycare Facility	Growing Light Montessori School of Oakland	4700 Lincoln Ave, Oakland
School	Montera Middle School	5525 Ascot Dr, Oakland
School	Head Royce School	4315 Lincoln Ave, Oakland
School	Ability Now Bay Area	4500 Lincoln Avenue, Oakland
School	Corpus Christi Elementary School	One Estates Dr, Piedmont
School	Edna Brewer Middle School	3748 13th Ave, Oakland
School	Oakland High School	1023 MacArthur Blvd, Oakland
Elderly Housing	Park Glenview Senior Apartments	3761 Park Blvd Way, Oakland
Elderly Housing	Satellite Senior Home	4135 Park Blvd, Oakland
Park	East Bay Municipal Utility District Watershed	Contra Costa County
Park	Huckleberry Botanic Regional Preserve	7087 Skyline Blvd, Oakland
Park	Sibley Volcanic Regional Preserve	6800 Skyline Blvd, Oakland

Table 5.3-3. Sensitive Receptors –Daycare Facilities, Schools, Elderly Housing, and Parks

Park	Oakland Regional Trails	Alameda County
Park	Skyline National Trail	Alameda County
Park	Shepherd Canyon Park	6000 Shepherd Canyon Rd, Oakland
Park	Marjorie Saunders Park	2588 Scout Rd, Oakland
Park	Joaquin Miller Park	3300 Joaquin Miller Rd, Oakland
Park	Dimond Canyon Park	4499 Bridgeview Dr, Oakland
Park	Dimond Park	3860 Hanly Rd, Oakland

5.3.2 Regulatory Setting

5.3.2.1 Federal

Clean Air Act and National Ambient Air Quality Standards

The federal Clean Air Act (CAA) establishes the statutory framework for regulation of air quality in the United States. Pursuant to this act, the EPA has established various regulations to achieve and maintain acceptable air quality, including the adoption of NAAQS, mandatory SIP or maintenance plan requirements to achieve and maintain NAAQS, and emission standards for both stationary and mobile sources of air pollution. NAAQS were first established in 1970 for six pollutants: CO, O_3, PM_{10} and $PM_{2.5}$, NO_2, SO_2, and lead. These pollutants are commonly referred to as criteria pollutants because they are considered the most prevalent air pollutants known to be hazardous to human health. The NAAQS contain primary standards that protect public health and secondary standards that protect public welfare. A summary of the NAAQS and the CAAQS is provided in Table 5.3-4.

Table 5.3-4. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[a]	NAAQS[b]	
			Primary[c]	Secondary[d]
O_3	8 hours	0.070 ppm	0.070 ppm	0.070 ppm
	1 hour	0.09 ppm	N/A	N/A
PM_{10}	Annual arithmetic mean	20 µg/m^3	N/A	N/A
	24 hours	50 µg/m^3	150 µg/m^3	150 µg/m^3
$PM_{2.5}$	Annual arithmetic mean	12 µg/m^3[e]	12 µg/m^3	15 µg/m^3
	24 hours	N/A	35 µg/m^3	35 µg/m^3
CO	8 hours	9 ppm	9 ppm	N/A
	1 hour	20 ppm	35 ppm	N/A
NO_2	Annual arithmetic mean	0.03 ppm	0.053 ppm	0.053 ppm
	1 hour	0.18 ppm	0.100 ppm	N/A
SO_2	24 hours	0.04 ppm	N/A	N/A
	3 hours	N/A	N/A	0.5 ppm
	1 hour	0.25 ppm	0.075 ppm[f]	N/A
Lead[f]	Calendar quarter	N/A	1.5 µg/m^3 (certain areas)	1.5 µg/m^3
	Rolling 3-month average	N/A	0.15 µg/m^3	N/A
	30-day average	1.5 µg/m^3	N/A	N/A
Visibility-reducing particles	8 hours	N/A[g]	N/A	N/A
Sulfates	24 hours	25 µg/m^3	N/A	N/A

Table 5.3-4. National and California Ambient Air Quality Standards

Hydrogen sulfide	1 hour	0.03 ppm	N/A	N/A
Vinyl chloride[h]	24 hours	0.01 ppm	N/A	N/A

Source: CARB 2016

[a] CAAQS for O_3, CO, SO_2 (1 hour and 24 hour), NO_2, and suspended particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles) are not to be exceeded. All others are not to be equaled or exceeded.

[b] NAAQS other than O_3, particulate matter, and those based on annual averages or annual arithmetic means are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration greater than 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, is equal to or less than the standard.

[c] NAAQS Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[d] NAAQS Secondary Standards: The levels of air quality necessary to protect the public welfare from known or anticipated adverse effects of a pollutant.

[e] The EPA recently adopted a lower annual $PM_{2.5}$ standard of 9 µg/m^3, which took effect on May 6, 2024.

[f] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 parts per billion.

[g] In 1989, CARB converted the general statewide 10-mile visibility standard to instrumental equivalents, which is "extinction of 0.23 per kilometer".

[h] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. CARB made this determination following the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

N/A = No standard exists for this pollutant averaging period

EPA classifies areas as being in attainment or nonattainment with the NAAQS for each criteria pollutant. The 1977 CAA amendment requires each state to develop and maintain a SIP for each nonattainment criteria pollutant. The SIP serves as a tool to help avoid and minimize emissions of nonattainment criteria pollutants and their precursor pollutants and achieve compliance with the NAAQS. In 1990, the CAA was amended to strengthen regulation of both stationary and mobile emission sources.

Toxic Air Contaminant and Odorous Emissions

In addition to the criteria pollutants, EPA also regulates emissions of hazardous air pollutants (HAPs) or TACs. TACs include airborne inorganic and organic compounds that can have both short-term (acute) and long-term (carcinogenic, chronic, and mutagenic) impacts on human health. Odorous compounds include those that can be detected by the human olfactory system, such as hydrogen sulfide and other sulfurous compounds.

Controlling air toxic emissions became a national priority with the passage of the CAA amendments in 1990, when Congress mandated that EPA regulate 188 air toxics. Prior to the 1990 CAA amendments, national emission standards were established for benzene, vinyl chloride, radionuclides, mercury, asbestos, beryllium, inorganic arsenic, radon 222, and coke oven emissions. The 1990 CAA amendments required EPA to set standards for categories and subcategories of sources that emit HAPs, rather than for the pollutants themselves. EPA began issuing the new standards in November 1994. National emission standards set before 1991 remain applicable.

Odorous emissions typically are regulated by local air districts under nuisance prohibitory rules. Because odor generally is a subjective phenomenon that affects people differently, development of odor emissions standards has proven impractical. Therefore, regulators have relied on the nuisance standard to assist in enforcing control of odorous emissions. Determination of the presence of a nuisance emission is based on the number of odor complaints received by the air district during an odor episode.

5.3.2.2 State

California Clean Air Act and Air Quality Standards

CARB is the state agency responsible for California air quality management, including establishment of CAAQS, mobile source emission standards, and GHG regulations, as well as oversight of regional air quality districts and preparation of implementation plans, including regulations for stationary sources of air pollution. The CAAQS generally are more stringent, except for the 1-hour NO_2 and SO_2 standards, and include more pollutants than the NAAQS (refer to Table 5.3-4). California specifies four additional criteria pollutants: visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Similar to the EPA, CARB designates counties in California as being in attainment or nonattainment for the CAAQS (refer to Table 5.3-2).

The California CAA, which was approved in 1988, requires each local air district, where ambient concentrations violate the CAAQS, to prepare an air quality management plan to achieve compliance with the CAAQS as a part of the SIP. CARB has ultimate responsibility for the SIP for nonattainment pollutants but relies on each local air district to adopt mandatory statewide programs and provide additional strategies for sources under its jurisdiction. The SIPs are a compilation of new and previously submitted plans, programs (monitoring, modeling, and permitting), district rules, state regulations, and federal controls. Local air districts and other agencies prepare SIP elements and submit them to CARB for approval. CARB forwards SIP revisions to EPA for approval and publication in the *Federal Register*.

Air Toxics

California's Air Toxic "Hot Spots" Information and Assessment Act (AB 2588), which was enacted in 1987, identifies TAC hot spots where emissions from specific sources may expose individuals to an elevated risk of adverse health effects, particularly cancer or reproductive harm. TACs also are referred to as HAPs. AB 2588 requires that a business or other establishment identified as a significant source of toxic emissions provide the affected population with information about health risks posed by the emissions. Diesel particulate matter (DPM) is the primary TAC emitted by construction activities.

CARB has adopted the Diesel Risk Reduction Plan (CARB 2000) and a series of airborne toxic control measures (ATCMs) for mobile and stationary sources, which are intended to reduce overall diesel exhaust emissions in California. CARB also has adopted ATCMs for controlling naturally occurring asbestos. CARB and local air districts have authority to enforce the federal National Emission Standards for Hazardous Air Pollutants regulations for asbestos. Key ATCMs and CARB regulations relevant to this project are described as follows:

- **ATCM for DPM from Portable Engines Rated at 50 Horsepower and Greater.** To reduce DPM emissions throughout the state, CARB has established the ATCM for DPM from Portable Engines Rated at 50 Horsepower and Greater (13 CCR Section 93116). This ATCM requires portable diesel-fueled engines having a maximum rating of 50 horsepower (hp) and greater to meet fleet-average DPM emissions standards.
- **ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling.** CARB has established the ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling to reduce public exposure to DPM and other pollutants by establishing idling restrictions, emission standards, and other requirements for heavy-duty diesel engines (13 CCR Section 2485). This ATCM applies to diesel-fueled commercial motor vehicles with a gross vehicle weight rating greater than 10,000 pounds that are licensed for operation on highways. Under this ATCM, vehicles will not idle for more than 5 consecutive minutes in any location. There also are provisions for alternative idle reduction technologies, such as internal combustion engine auxiliary power systems, including required compliance with emissions performance specifications.
- **Regulation for In-Use Off-Road Diesel-Fueled Fleets.** CARB has established the Regulation for In-Use Off-Road Diesel-Fueled Fleets to reduce NOx, DPM, and other criteria pollutant emissions from in-use off-road diesel-fueled vehicles (13 CCR Section 2449). This regulation applies to all self-propelled

off-road diesel vehicles rated 25 hp or greater, including vehicles that are rented or leased, and requires restricted vehicle idling time, reporting of vehicle use, and compliance with fleet-average emission standards. It also provides a schedule by which lower-tiered engines cannot be added to a vehicle fleet.

- **Statewide Portable Equipment Registration Program.** Voluntary registration under the Statewide PERP allows owners or operators of portable engines to operate their equipment throughout California without having to obtain individual air district permits (13 CCR Sections 2450 through 2465). Diesel engines eligible for PERP registration must not be self-propelling, must be certified to Tier 4 emissions standards, and must not reside in the same location longer than 12 consecutive months. Examples of portable equipment include generators, plate compactors, drills, and welders.
- **Asbestos ATCM for Construction, Grading, Quarrying, and Surface-Mining Operations.** CARB has established the Asbestos ATCM for Construction, Grading, Quarrying, and Surface-Mining Operations to minimize the generation of asbestos from earth disturbance or construction activities (13 CCR Section 93105). The Asbestos ATCM applies to any project that will include sites to be disturbed in a geographic ultramafic rock unit area or an area where naturally occurring asbestos (NOA), serpentine, or ultramafic rocks are determined to be present. The Asbestos ATCM establishes notification, management practices, mitigation plans, transport and disposal, and administrative (recordkeeping and reporting) requirements for subject projects to reduce the generation of asbestos from all aspects of construction, grading, quarrying, and mining operations. The project is neither located in an area where NOA has historically been encountered (Churchill and Hill 2000; USGS 2011), nor is it expected based on the known types of soil in the project vicinity. If NOA is encountered during construction, the project will comply with the requirements of the Asbestos ATCM.

Sierra Club v. County of Fresno (The Friant Ranch Decision)

In Sierra Club v. County of Fresno ([2018] 6 Cal. 5th 502), the California Supreme Court held that portions of the air quality analysis in Fresno County's EIR for the 942-acre Friant Ranch Specific Plan violated CEQA (Supreme Court of California 2018). The case reviewed the regional air quality analysis contained in the EIR for the proposed Friant Ranch development in unincorporated Fresno County. Located in the San Joaquin Valley Air Basin, the Friant Ranch project area is currently designated as nonattainment for multiple NAAQS and CAAQS, including ozone, $PM_{2.5}$, and PM_{10}. The Court ruled that the air quality analysis failed to adequately disclose the nature and magnitude of long-term air quality impacts from project-related emissions of criteria pollutants and precursors "in sufficient detail to enable those who did not participate in its preparation to understand and consider meaningfully the issues the proposed project raises." The Court noted that the air quality analysis did not provide a discussion of the foreseeable adverse effects of project-generated emissions on Fresno County's likelihood of exceeding the NAAQS and CAAQS for criteria pollutants, nor did it explain why it was not "scientifically possible" to determine such a connection.

5.3.2.3 Regional

Air District Regulations

The project is located within the jurisdiction of the BAAQMD. The BAAQMD is the regional agency charged with preparing, adopting, and implementing emission control measures and standards for stationary sources of air pollution pursuant to delegated state and federal authority. Because the project will not involve construction and long-term operation of new stationary sources of criteria pollutants or TACs, such as emergency generators, there are no permitting regulations relevant to the project. However, the project will be subject to the trackout minimization provisions of BAAQMD Regulation 6, Rule 6 based on the total land area covered by construction activities exceeding 1 acre, as well as the asbestos removal provisions of BAAQMD Regulation 11, Rule 2. These requirements, described in the following subsections, are expected to be met through implementation of the APMs discussed in Section 5.3.4.2.

BAAQMD Regulation 6, Rule 6. This rule aims to limit the quantity of particulate matter in the atmosphere through control of trackout of solid materials onto paved public roads outside the boundaries of Large Bulk Material Sites, Large Construction Sites, and Large Disturbed Surface sites including landfills. Fugitive dust visible emissions during cleanup of trackout shall not exceed 20 percent opacity for a period or aggregate periods of more than 3 minutes in any 60-minute period. Any site that produces trackout shall monitor the trackout and maintain proper documentation according to the rule.

BAAQMD Regulation 11, Rule 2. This rule aims to control emissions of asbestos during demolition and establish appropriate waste disposal procedures for asbestos-containing materials. Demolition is defined as the wrecking, moving, or dismantling of any load-supporting structural member, or portion thereof, of a building or facility and includes, but is not limited to, any related cutting, disjointing, stripping, or removal of structural elements. Under this rule, visible emissions of asbestos-containing material are strictly prohibited. To prevent such emissions, BAAQMD provides explicit procedures by which asbestos-containing materials should be treated during cutting, stripping, demolition, removal, handling, and disposal. The affected structure shall also be thoroughly surveyed prior to commencement of demolition. A written plan or notification of intent to demolish, even if there is no asbestos present, shall be provided to BAAQMD at least 10 days prior to commencement of demolition.

Air Quality Plans

Under the California CAA, which was approved in 1988 and amended in 1992, BAAQMD is required to develop an air quality plan to achieve and maintain compliance with federal and state nonattainment criteria pollutants within the air district. In response, BAAQMD has developed the 2017 Bay Area Clean Air Plan to achieve and maintain compliance with the state and federal O_3 and particulate matter standards. This plan, which was adopted in April 2017, provides a regional strategy to protect public health and the climate through a wide range of control measures designed to decrease emissions of O_3, particulate matter, and TACs. These emission reductions will be achieved primarily through the reduction of fossil fuel combustion, but also through minimization of methane leaks associated with natural gas distribution, improved building energy efficiency, and the promotion and advancement of clean vehicles. To fulfill state O_3 planning requirements, the 2017 control strategy also includes all feasible measures to reduce emissions of O_3 precursors (ROG and NOx) and reduce transport of O_3 and its precursors to neighboring air basins (BAAQMD 2017a; BAAQMD 2024b).

Additionally, monitoring data indicate that $PM_{2.5}$ levels have decreased in the Bay Area since 2008. As a result, CARB submitted a "clean data finding" request to the EPA on behalf of BAAQMD on December 8, 2011. This request was approved by the EPA on January 9, 2013, and suspends key SIP requirements if monitoring data continue to show attainment of the standard. Despite this approval, the SFBAAB will continue to be designated as nonattainment for the federal 24-hour $PM_{2.5}$ standard until BAAQMD submits a redesignation request and a $PM_{2.5}$ maintenance plan (BAAQMD 2024a).

BAAQMD CEQA Guidelines

BAAQMD adopted CEQA Guidelines in December 1999 to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality (BAAQMD 1999). BAAQMD updated its CEQA Guidelines in June 2010 to reference its newly adopted thresholds of significance. These thresholds of significance were challenged in court but were ultimately upheld by the California Supreme Court. BAAQMD published a revised version of its CEQA Guidelines in May 2017 (BAAQMD 2017b) and again in April 2023, following 2022 updates to its CEQA significance thresholds for climate impacts from land use projects (housing and commercial [office and retail] uses) and plans (BAAQMD 2023; BAAQMD 2022). Lead agencies may, at their discretion, use BAAQMD's current thresholds of significance to help inform environmental review for development projects in the Bay Area and the current BAAQMD CEQA Guidelines for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures (BAAQMD 2023; BAAQMD 2022). PG&E reviewed the BAAQMD CEQA Guidelines and did not seek additional guidance from the BAAQMD for the project.

5.3.2.4 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations, respectively. However, plans and policies for the City of Orinda, Contra Costa County, the City of Oakland, and the City of Piedmont are considered for informational purposes to assist with the CEQA review process, based on the expected location of project construction activities. These counties and cities are considered local agencies that must comply with their own plans and policies, as described in the following subsections.

City of Orinda

The City of Orinda's Municipal Code contains provisions governing construction and operational activities that may affect air quality, including the following (City of Orinda 2024):

- **17.15.2, General Performance Standards**. The performance standards for air contaminants require compliance with the rules, regulations, and standards of BAAQMD. These provisions also require submittal of any BAAQMD-issued permits with the Zoning Administrator prior to receiving approval by the City.
- **17.38.2, Demolition Permit**. Demolition permits are required and will not be issued by the City until all prior approvals and permits have been obtained for the replacement structure, including building permits.

In addition, the goals and policies identified in the *City of Orinda General Plan* to increase energy conservation and renewable energy resources will have the added benefit of reducing criteria pollutant and TAC emissions associated with the combustion of fossil fuels (City of Orinda 2023). These policies are discussed in more detail in Section 5.6, Energy.

Contra Costa County

The goals and policies identified in the *Contra Costa County General Plan* and *Climate Action Plan* to decrease energy use, improve energy efficiency, develop renewable energy, and reduce vehicle miles traveled will have the added benefit of reducing criteria pollutant and TAC emissions associated with the combustion of fossil fuels (Contra Costa County 2024). These policies are discussed in more detail in Section 5.6, Energy.

City of Oakland

The City of Oakland's Municipal and Planning Codes contain provisions governing construction and operational activities that may affect air quality, including the following (City of Oakland 2024b):

- **15.36, Demolition Permits.** This provision requires a demolition permit prior to commencement of structure demolition. A demolition permit can be obtained without a building permit if the structure to be demolished is part of a project with a valid conditional use permit or planned unit development approval. Throughout all phases of work, best management practices shall be used to prevent fugitive dust nuisance and the discharge of any air contaminants that will violate city or regional air pollution control rules, regulations, ordinances, or statutes. A dust control plan also may be required as a condition of the issued demolition permit.
- **17.120.080, Performance Standards – Particulate matter and air contaminants.** Under this provision, all industrial activities near residential zones shall not emit particulate matter or air contaminants which are readily detectable without instruments by the average person at or beyond any lot line of the lot containing such activities.

In addition, the goals and policies identified in the City of Oakland's *2030 Equitable Climate Action Plan* to increase energy conservation and renewable energy resources will have the added benefit of reducing criteria pollutant and TAC emissions associated with the combustion of fossil fuels (City of Oakland 2024a). These policies are discussed in more detail in Section 5.6, Energy.

City of Piedmont

The objectives identified in the City of Piedmont's *Climate Action Plan 2.0* to increase renewable energy consumption, reduce energy consumption, and accelerate the adoption of electric vehicles will have the added benefit of reducing criteria pollutant and TAC emissions associated with the combustion of fossil fuels (City of Piedmont 2024). These objectives are discussed in more detail in Section 5.6, Energy.

5.3.3 Impact Questions

The project's potential effects related to air quality were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.3-5 and discussed in more detail in Section 5.3.4.

Table 5.3-5. CEQA Checklist for Air Quality

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) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

5.3.3.1 Additional CEQA Impact Questions

None.

5.3.4 Potential Impact Analysis

Project impacts related to air quality were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.3.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project-related impacts on air quality were evaluated for each of the criteria listed in Table 5.3-5, as discussed in Section 5.3.4.3.

CEQA Guidelines state that the significance criteria established by the air quality management or air pollution control district may be relied on to make impact determinations. The BAAQMD's 2022 CEQA

Guidelines (BAAQMD 2023) provide recommended air quality emission thresholds for CO, NOx, ROG, PM_{10}, $PM_{2.5}$, and TACs for evaluating the significance of project emissions. If the emissions are below the significance thresholds, impacts would be considered less than significant. If the construction- or operations-phase emissions are greater than the significance thresholds, impacts during that phase would be considered significant. Table 5.3-6 presents the BAAQMD air quality significance thresholds applicable to the project (BAAQMD 2023).

Table 5.3-6. BAAQMD Air Quality Thresholds of Significance

Pollutant	Construction Related	Operational	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tpy)
ROG	54	54	10
NOX	54	54	10
PM_{10}	82 (exhaust) BMPs (fugitive dust)	82	15
$PM_{2.5}$	54 (exhaust) BMPs (fugitive dust)	54	10
CO[a]	None	9.0 ppm (8-hour average) 20.0 ppm (1-hour average)	
TACs	Cancer Risk > 10.0 in 1 million Chronic Hazard Index > 1.0 Acute Hazard Index > 1.0 PM2.5 Increase > 0.3 µg/m^3 (annual average)		

Source: BAAQMD 2023

[a] If a project meets all of BAAQMD's screening criteria, modeling would not be required to demonstrate compliance with these significance thresholds for localized CO impacts.

BMPs = best management practices
lbs/day = pound(s) per day
tpy = ton(s) per year

5.3.4.2 Applicant-Proposed Measures

The project will have a less-than-significant-impact on air quality with implementation of APMs. Several APMs discussed in other sections will help reduce fugitive dust and criteria pollutants from construction activities, including APM GHG-1, which includes measures to reduce energy and fuel use such as construction worker carpooling. In addition, APM HYD-1, which requires erosion control measures during construction as part of the Stormwater Pollution Prevention Plan, and APM AES-1, which includes revegetating disturbed areas after construction, will help reduce fugitive dust emissions, although these APMs were not included in calculations of emissions reductions. APM AIR-1 and APM AIR-3 were included in the calculations of emissions reductions.

Additional measures to reduce air emissions include the following APMs:

APM AIR-1: Dust Control During Construction

PG&E will implement measures to control fugitive dust consistent with BAAQMD's Basic Best Management Practices (BAAQMD 2023) as follows:

- All exposed surfaces within the active construction area (for example, parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day as necessary to contain dust.
- All haul trucks transporting soil, sand, or other loose material offsite will be covered.
- All visible mud or dirt trackout onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
- All grading activities shall be suspended when average wind speeds exceed 20 mph. If excavating soils when average wind speeds exceed 20 mph, soil piles will be lightly sprayed with water to contain dust to the work area.
- Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

Where project activities are within 1,000 feet of residential areas, PG&E will also implement the following additional BMPs, consistent with BAAQMD's Enhanced BMPs (BAAQMD 2023):

- Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities.
- Minimize the amount of excavated material or waste materials stored at the site.
- Stabilize soil where project grading occurred and the area is inactive for at least 14 calendar days. Soil stabilization measures may include wood mulch, gravel, seeding or application of other non-toxic soil stabilizer consistent with APM HYD-1.

APM AIR-2: Asbestos Management

If any load-bearing structure (poles, towers, concrete pads) is to be removed, this project will require asbestos testing and notification to BAAQMD. Notify the Environmental Field Specialist (EFS) at least 45 days prior to work commencing. BAAQMD must be notified at least 10 working days prior to work (demolition) commencing. If the construction start date changes, notify the EFS immediately as notification to BAAQMD may need to be resubmitted. EFS is responsible for obtaining any necessary permits from BAAQMD prior to the start of work.

APM AIR-3: Minimize Construction Equipment Exhaust

PG&E will minimize construction equipment exhaust as follows:

- Use low-emission or electric construction equipment where feasible.
- Ensure that cranes, off-highway trucks, and tractors/loaders/backhoes used during project construction will comply with Tier 4 emissions standards, pending availability.
- Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time will depend on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following startup that limit their availability for use following startup. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction supervisors will include briefings to crews on vehicle use as part of preconstruction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use.

5.3.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

Potential project impacts on air quality were evaluated against the CEQA significance criteria and are discussed in further detail in the following paragraphs. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

a) Would the project conflict with or obstruct implementation of the applicable air quality plan? Less-than-Significant Impact.

Air quality plans provide an overview of the region's air quality and identify the pollution control measures needed to expeditiously attain and maintain air quality standards. These air quality plans propose emission-reduction measures that are designed to bring the region into attainment of the CAAQS and NAAQS. Federal, state, and regional air quality regulations and rules were developed by incorporating the requirements from the air quality plans to ensure the implementation of these plans. The project will comply with applicable federal, state, and local regulations as further discussed in the following paragraphs. Since the regional air regulations and rules are developed to ensure the implementation of the regional air quality plans, compliance with these regulations indicates that the project's activities will not obstruct implementation of the air quality plans of the region.

In addition to the air quality regulations and rules, BAAQMD adopted emission thresholds for CEQA evaluation to ensure that the project emissions will not conflict with or hinder the implementation of the air quality plans. Therefore, consistency with the air quality plans and standards is also analyzed by evaluating whether the project's emissions will exceed BAAQMD's CEQA significance thresholds.

Construction

Construction activities will cause temporary air pollutant emissions. The project construction activities are evaluated as occurring at multiple sites between 2026 and 2030 and include the following activities:

- 115 kV power line rebuilds
- Moraga Substation upgrades
- Oakland X Substation upgrades

A summary of the project's average daily construction emissions is provided in Table 5.3-7. The emissions include those from the onsite off-road construction equipment; offsite on-road vehicles such as worker commute vehicles, material and equipment transport trucks, vendor delivery trucks, construction support vehicles; helicopters; and fugitive dust associated with earth-moving activities and re-entrained road dust from vehicle travel on paved and unpaved roads. Implementation of the CDFW Bay Area Operations and Maintenance Incidental Take Permit (ITP), Item 5.11, will remove mud and accumulated soils (including dust) from construction vehicles and equipment to the maximum extent possible and clean construction vehicles and equipment before entering a new work site in the unpaved areas of the eastern section of the project. The work areas in the central and western sections of the project will have limited offroad travel, so construction vehicles and equipment are not expected to accumulate mud or soil. These emissions were estimated per the methodology described in Section 5.3.1.1, based on the construction schedules and the anticipated overlapping construction activities that will potentially occur on the same day. Details of the emission calculations are provided in Appendix A. APMs are implemented as part of the project; however, construction emissions are shown with and without APMs for informational purposes.

Table 5.3-7. Estimated Construction Emissions

Construction Period	Average Daily Emissions (lbs/day)					
	ROG	CO	NOx	SO2	PM10a	PM2.5[a]
Construction without APMs	16	119	96	9	10	22
Construction with APMs[b]	16	119	49	9	9	11

Table 5.3-7. Estimated Construction Emissions

Construction Period	Average Daily Emissions (lbs/day)					
	ROG	CO	NOx	SO2	PM10a	PM2.5[a]
BAAQMD Construction Significance Thresholds	54	N/A	54	N/A	82	54
Exceeds Threshold?	No	No	No	No	No	No

[a] PM10 and PM2.5 emissions represent both exhaust and fugitive dust emissions, even though the BAAQMD's significance thresholds are specific to exhaust.

[b] These emission estimates account for reductions achieved through incorporation of APM AIR-1, APM AIR-3, CDFW Bay Area Operations and Maintenance ITP Item 5.11, and APM GHG-1, which target fugitive dust emissions and construction equipment exhaust emissions.

N/A = Not available (no significance threshold exists)

As shown, project construction emissions with incorporation of APM AIR-1, APM AIR-3, CDFW Bay Area Operations and Maintenance ITP, Item 5.11, and APM GHG-1 as part of the project will be lower than the BAAQMD's CEQA thresholds for all pollutants analyzed. In addition to stabilization of disturbed areas during construction (APM AIR-1), APM AES-1 will be implemented upon the completion of project construction to return staging areas and work areas to pre-project conditions, including revegetating or repaving disturbed areas. Therefore, the project will not conflict with or obstruct implementation of the applicable air quality plan and thus will have less-than-significant impacts during construction.

Operation and Maintenance

Because the project involves the rebuilding of existing infrastructure, no change to current operation and maintenance activities is expected. For this reason, the change in operational air emissions from the project were not estimated but were instead presumed to be zero. With no change in operational air emissions, the operation and maintenance of the project will not conflict with or obstruct implementation of the applicable air quality plan and thus will have no impact.

b) **Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard? *Less-than-Significant Impact.***

Under federal standards, SFBAAB has been designated by the EPA as nonattainment for O_3 and $PM_{2.5}$. Under state standards, SFBAAB has been designated by CARB as nonattainment for O_3, PM_{10}, and $PM_{2.5}$. In its CEQA Guidelines, the BAAQMD has provided project-level thresholds of significance for criteria pollutants for which the SFBAAB is in nonattainment, as well as for elevated localized concentrations of CO (refer to Table 5.3-6). These are the levels at which the BAAQMD has determined that an individual project's contribution to the cumulative impact (nonattainment) is cumulatively considerable (BAAQMD 2023). In other words, if an individual project's contribution (even with incorporation of all feasible mitigation measures) exceeds the thresholds, the project will have a significant and adverse impact. Alternately, if an individual project's contribution is below the project-level thresholds of significance, the project will have a less-than-significant impact.

Construction

Based on the criterion described above, project construction will not result in a cumulatively considerable net increase in the nonattainment pollutants (PM_{10}, $PM_{2.5}$, and the O_3 precursors [NOx and ROG]) because the emissions will be temporary; the average daily emissions are less than the significance thresholds with implementation of APM AIR-1, APM AIR-3, and APM GHG-1, as summarized in Table 5.3-7; and BMPs for reducing fugitive dust emissions will be implemented through APM AIR-1, as required by BAAQMD, CDFW Bay Area Operations and Maintenance ITP, Item 5.11, in the eastern section of the project, APM HYD-1 during construction, and APM AES-1 upon completion of project construction. Therefore, construction of the project will not result in a cumulatively considerable net increase of any pollutants for which the region is in nonattainment and there will be a less-than-significant impact.

Additionally, project construction will result in up to 478 additional vehicle trips per day (from worker commutes and truck trips) during peak construction activities. These trips are expected to occur throughout the project area. The project is expected to meet all of the following screening criteria for localized CO and will not result in a cumulatively considerable net increase of localized CO (BAAQMD 2023):

The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, the regional transportation plan, and local congestion management agency plans.

Project-generated traffic will not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.

Project-generated traffic will not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and horizontal mixing of air is substantially limited (tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

Operation and Maintenance

There will be no change in operational air emissions from this project relative to current levels associated with existing infrastructure. Therefore, operation of the project also will not result in a cumulatively considerable net increase of any pollutants for which the region is in nonattainment and there will be no impact.

c) Would the project expose sensitive receptors to substantial pollutant concentrations? *Less-than-Significant Impact*.

Construction

Construction activities will involve the operation of heavy equipment and activities that will temporarily produce additional dust and air emissions. Construction activities will be spread across the approximately five-mile power line alignment and adjacent substations. As stated in Section 5.3.1.4, much of the project is within residential areas with more than 4,000 residential properties located within 1,000 feet of the project. There are also approximately 2 elderly housing facilities, approximately 10 daycare facilities, approximately 10 schools, and approximately 10 parks located within 1,000 feet of the project. These sensitive receptors could be affected by construction-generated air emissions depending on location, distance, and duration of construction activities; however, exposure will be periodic and temporary. Residences located near the helicopter landing zones and laydown yards may experience increased dust during periodic and temporary helicopter takeoff and landing activities in the eastern section of the project. Two potential landing zones are near several residences in Orinda; the other landing zones and laydown yards are not near residences.

The implementation of APM AIR-1 and CDFW Bay Area Operations and Maintenance ITP, Item 5.11, will control fugitive dust in construction areas as appropriate through watering, use of a soil stabilizer, or cleaning construction vehicles and equipment to remove mud or accumulated soils, including dust. Erosion control measures in APM HYD-1 will be implemented during construction and also will help reduce fugitive dust. APM AES-1 will be implemented upon the completion of project construction to return staging areas and work areas to pre-project conditions, including revegetating or repaving of disturbed areas.

In addition, as shown in Table 5.3-7, criteria pollutant emissions from project construction will be below the BAAQMD's significance thresholds with implementation of APM AIR-1, APM AIR-3, and APM GHG-1, indicating that the project is unlikely to cause violations to the ambient air quality standards that were developed to protect public health. Therefore, the project will not expose sensitive receptors to substantial criteria pollutant concentrations.

TACs from project construction will generally be associated with DPM from diesel-fueled engines. TACs can result in health risks associated with exposure to DPM from diesel equipment, vehicles, and generators (CARB 1998). It is expected that implementation of APM AIR-1, which is required by BAAQMD, and compliance with CARB's ATCMs and regulations limiting idling from diesel-fueled fleets, as applicable, will further reduce the project's already less-than-significant DPM emissions (conservatively represented by PM_{10} emissions). Therefore, project construction will not expose sensitive receptors to substantial TAC concentrations.

As described in BAAQMD's CEQA Guidelines, the generation of TACs will be temporary as a result of the variable nature of construction activities, "especially considering the short amount of time such equipment is typically within an influential distance that will result in the exposure of sensitive receptors to substantial concentrations" (BAAQMD 2017b). In addition, "current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities" (BAAQMD 2017b). For these reasons, a health risk assessment was not considered appropriate for project construction.

Operation and Maintenance

Because there is no change in operation air emissions as a result of this project, cancer and noncancer (chronic and acute) risks were not estimated from project operation.

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

Construction and operation of the project will not result in other emissions, including those leading to odors that will adversely affect a substantial number of people. Typical odor nuisances include hydrogen sulfide, ammonia, chlorine, and other sulfide-related emissions. However, no significant sources of these pollutants will be used during construction. Construction of the project will require use of diesel-based equipment that will result in emissions of diesel fumes. Diesel odors from construction may be perceived as objectionable in lower concentrations than required to cause a health risk. However, any odors from construction will be periodic and temporary in nature. Therefore, impacts related to odors and other emissions during construction will be less than significant. Because there is no change in operation air emissions as a result of this project, no change in other emissions, including those leading to odors, will occur.

5.4 Biological Resources

This section describes biological resources (vegetation, wildlife, and aquatic resources) in the biological study area (BSA), identifies potential impacts on sensitive habitats and species that could result from the implementation of the project, and concludes that impacts on biological resources will be less than significant. Incorporation of the PG&E Bay Area Operations and Maintenance Habitat Conservation Plan (BAHCP) and Bay Area O&M ITP measures, APMs from the ITP Final Environmental Impact Report (FEIR), and additional project-specific APMs, all of which are presented in Section 5.4.5.2, will further minimize potential less-than-significant project impacts to biological resources. The project's potential effects on biological resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Tables 5.4-7 and 5.4-8 and are discussed in more detail in Section 5.4.5. Figure 5.4-1 and Figure 5.4-2 identify the BSA for the project, which includes a botanical study area, an aquatic study area, and a wildlife study area and project components.

5.4.1 Methodology and Environmental Setting

5.4.1.1 Methodology and Biological Study Areas

This section summarizes the methods used to identify biological resources, including waters, wetlands and other sensitive natural vegetation communities, and special-status plants and wildlife species, and to analyze potential impacts. Protocol-level botanical surveys targeting special-status plants and sensitive natural communities with the potential to occur are summarized in the Botanical Resources Survey Report (Appendix B1). The aquatic resource delineation is presented in the Aquatic Resources Delineation Report (Appendix B2). The Wildlife Assessment Report provides a detailed assessment of wildlife species with potential to occur (Appendix B3) and habitat characterization.

The project footprint is defined as the area that may be directly affected by the proposed project and represents the maximum extent of ground-disturbing activities at potential work areas (which includes existing and proposed replacement structure locations, existing substation properties, staging areas, and helicopter landing zones) and access roads. The BSA included a 1,000-foot-wide buffer around the project footprint; this buffer, corresponding to the mapped wildlife study area on Figure 5.4-1, was used during the desktop reviews and is the term used when describing the project's existing setting. The wildlife area that was surveyed, a subsection of the study area, focused on areas adjacent to and within the project footprint. The botanical study area was entirely surveyed, so the botanical survey area and study area are the same and set at the same distances from project footprint. Similarly, the aquatic study area and the aquatic survey area included the same distances from the project footprint.

The botanical resources study area and field survey area (botanical study and survey area on Figure 5.4-1) (Section 5.4.1.1.2.1) covered approximately 247 acres and included a 250-foot-wide buffer around the existing power lines and potential work areas between Moraga Substation and Manzanita Drive. A 50-foot-wide buffer was used around the power lines and work areas from Manzanita Drive to Park Boulevard at Estates Drive excluding adjacent private property. A 50-foot-wide buffer was used around each structure work location between Park Boulevard and Oakland X Substation. This buffer was used because only the structure locations will be accessed as part of the project, and access to adjacent areas is constrained by private property. A 25-foot-wide buffer was used around the existing unpaved access roads between Moraga Substation and Manzanita Drive and underground route options west of SR 13. The botanical resources field surveys were conducted in 2021 and included an underground route on Monterey Boulevard, Lincoln Avenue, and MacArthur Boulevard that is a portion of Alternative A but not a part of the proposed project.

The aquatic resources delineation study area and field survey area (aquatic study and survey area) (Section 5.4.1.1.2.2) covered approximately 226 acres and included a 100-foot-wide buffer around potential work areas (including staging areas and helicopter laydown areas) and a 10-foot-wide buffer on either side of existing unpaved access roads.

The BSA and wildlife study area covered the project footprint and a 1,000-foot buffer from the project footprint, which included approximately 2,258 acres, with approximately 1,968 acres for the main portion of the project and approximately 290 acres for the potential staging areas near the community of Wilder and off of SR 24. The smaller wildlife field survey area (Section 5.4.1.1.2.3) included a 50-foot-wide buffer around the existing power lines and potential work areas and a 25-foot-wide buffer around access roads (with an assumed unpaved access road width of 12 feet, this is 62 feet total width) for a total of approximately 171 acres. No wildlife field survey was conducted for the proposed underground segments west of the Park Boulevard and Estates Drive intersection because this portion of the project is located within a heavily populated urban area and could be assessed during the desktop review.

As used here, the term "special-status species" is defined to include plants and animals meeting one or more of the following criteria:

- Listed, proposed for listing, or candidate for listing as threatened or endangered under the federal Endangered Species Act (FESA; 50 Code of Federal Regulations [CFR] 17.11 for wildlife; 50 CFR 17.12 for plants; 67 *Federal Register* [FR] 40658 for candidate species, and various notices in the *Federal Register* for proposed species)
- Listed under the California Endangered Species Act (CESA) as threatened or endangered, or proposed or candidates for listing
- Designated as rare under the Native Plant Protection Act

Species that otherwise meet the definition of rare, threatened, or endangered species under CEQA Guidelines Section 15380; this includes species listed by the California Native Plant Society (CNPS) in the online version of its Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2022) as California Rare Plant Rank (CRPR) 1A, 1B, 2A and 2B. CRPR 3 (review list) and 4 (watch list) species are discussed further in Appendix B1. Special-status wildlife includes species that meet one or more of the following criteria:

- Listed, proposed for listing, or candidate for listing as threatened or endangered under FESA
- Listed or candidate for listing as threatened or endangered under CESA
- Designated as a Species of Special Concern (SSC), Watch List (WL) Species, or a Fully Protected Species by the CDFW (CDFW 2023a)
- Designated as a Bird of Conservation Concern by the USFWS
- Bird species protected under the federal Bald and Golden Eagle Protection Act (BGEPA)
- Bat species considered by the Western Bat Working Group (WBWG) Regional Bat Species Priority Matrix as "Red or High"; these species are considered "imperiled or are at high risk of imperilment" (WBWG 2017)

Natural communities are considered sensitive if they are ranked as critically imperiled (S1), imperiled (S2), or vulnerable (S3) on the CDFW and List of California Sensitive Natural Communities (CDFW 2023b).

Database and Literature Review

The following biological databases were queried for records of special-status plants, natural communities, and wildlife that might have potential to occur in the BSA:

- USFWS Information for Planning and Consultation (USFWS 2023a)
- California Natural Diversity Database (CNDDB) (CDFW 2021b, 2023c)
- CNPS online Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2021, 2023)
- Consortium of California Herbaria (CCH) Portal 1 and Portal 2 (CCH 2021a, 2021b)

A CNDDB search for special-status species was conducted for the Oakland East quadrangle, where the project is entirely located, and for the following surrounding quadrangles: Richmond, Briones Valley, Walnut Creek, Oakland West, Las Trampas Ridge, Hunter's Point, San Leandro, and Hayward. The CNPS online inventory also was queried for these 9 quadrangles. A species list was generated from the USFWS San Francisco Bay-Delta Fish and Wildlife Office using the BSA boundaries as the search extent.

Other information sources consulted to determine which special-status species could potentially occur in the BSA included the following:

- Natural Resources Conservation Service (NRCS) Web Soil Survey, to obtain information about soils in the BSA (USDA 2021)
- The PG&E O&M BAHCP, to obtain information about covered activities and covered species (PG&E 2017)
- Aerial photographs
- Jepson Manual: Vascular Plants of California (Baldwin et al. 2012)

Although not considered special status, locally rare plant species are tracked as part of the Database of Rare, Unusual, and Significant Plants of Alameda and Contra Costa Counties (Lake 2021). Presence of these species was documented in Appendix B1.

Field Surveys

Biologists surveyed all undeveloped areas in the defined field survey areas that might include habitat for sensitive biological resources. Table 5.4-1 presents the dates and survey personnel for the various field surveys conducted for the project. The surveys are described in more detail in the following subsections.

Table 5.4-1. Survey Types, Dates, and Personnel

Survey	Date	Personnel	Firm
Botanical	March 11, 12, and 15, 2021 April 14 to 16, 2021 May 17 and 18, 2021 July 12 and 13, 2021	Adam Chasey Cody Ender Brian Peterson	Nomad
Aquatic Resources	December 12, 28, and 29, 2023 January 12, 2024	Kevin Fisher Pim Laulikitnont-Lee	Jacobs
Wildlife Assessment	December 8, 2023	Cole Paris William McCall	SBI
	December 12, 2023	William McCall Laura Coatney	

Jacobs = Jacobs Engineering Group Inc.
Nomad = Nomad Ecology, LLC
SBI = Swaim Biological, Inc.

Botanical Surveys

Prior to conducting the botanical surveys, a desktop review was conducted for occurrences of special-status plant species in the vicinity of the botanical study and survey area shown on Figure 5.4-1. Habitat types were identified in the field within that area and evaluated for special-status plant suitability. Botanical surveys using USFWS (2000), CDFW (2018), and CNPS (2001a) protocols were conducted by Nomad botanists Adam Chasey, Cody Ender, and Brian Peterson as shown in Table 5.4-1. The surveys were timed to coincide with blooming periods for special-status plant species identified as having the potential to occur in the botanical study and survey area.

The surveys were conducted on foot and progressed from Moraga Substation west in sections covering all natural habitats (excluding developed and residential/commercial landscaped areas). To ensure the timing of botanical surveys coincided with the flowering phenology of the target species, reference populations and collection dates of herbaria specimens were examined. The methods used and detailed results of the botanical surveys for the project are presented in the Botanical Resources Survey Report (Appendix B1).

Vegetation communities were characterized and mapped as part of the field survey effort within the botanical study and survey area and classified according to Holland (Holland 1986). Vegetation communities within the BSA are mapped using Conservation Lands Network (CLN) 2.0 Vegetation Types and sensitive vegetation communities are mapped within the botanical survey area (refer to Figure 5.4-2).

Aquatic Resources Delineation

Aquatic resources and other watercourses in the aquatic study and survey area (Figure 5.4-1) that may be subject to jurisdiction under the federal Clean Water Act (Sections 404 and 401) and/or Section 10 of the Rivers and Harbors Act of 1899, Porter-Cologne Water Quality Control Act, and CDFW Fish and Game Code (CFGC) (Section 1600 et seq.) were identified and delineated for the project. Riverine aquatic resources were delineated based on guidance provided in the USACE Regulatory Guidance Letter 05-05 (USACE 2005) and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). A desktop review of the National Wetlands Inventory, National Hydrography Dataset, and California Aquatic Resource Inventory mapping databases and current and historic aerial imagery (USFWS 2023b; USGS 2021; San Francisco Estuary Institute 2020, Google Earth 2023) was performed before conducting the field surveys.

Aquatic resources were delineated using the methods for sampling and evaluating each parameter—hydrology, soils, and vegetation—in accordance with *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008) and performed by Jacobs biologists as shown in Table 5.4-1. The methods used and detailed results of the aquatic resources delineation for the project are presented in the Aquatic Resources Delineation Report (Appendix B2).

Wildlife Assessment

During the desktop review, habitat and land cover types were verified within a 1,000-foot buffer of the project footprint (BSA or wildlife study area) with reference to the previously mapped vegetation communities (Section 5.4.1.1.2.1) and mapped modeled habitats from the BAHCP (Sections 5.4.2.8.1 and 5.4.3.4.1). A wildlife assessment (visual reconnaissance survey) was conducted by SBI biologists Cole Paris and William McCall on December 8, 2023, and by William McCall and Laura Coatney on December 12, 2023, in the wildlife study area as shown on Figure 5.4-1.

The CLN 2.0 Vegetation Map mapping was used in vegetation characterization for wildlife habitat evaluations that extended outside the botanical survey area. The CLN 2.0 Vegetation Map is a coarse filter map with the goal of capturing ecological diversity at the local and regional scales in the San Francisco Bay Area (Bay Area Open Space Council 2019).

The wildlife survey entailed walking meandering transects in the wildlife survey area to evaluate habitat values and areas with potential to support special-status wildlife species as identified in desktop-level reviews. In addition, baseline data were collected for special-status wildlife species. Uplands and aquatic features in the wildlife survey area were evaluated to determine habitat suitability. No protocol-level surveys were conducted as part of the wildlife assessment. The methods used and detailed results of the wildlife assessment for the project are presented in the Wildlife Assessment Report (Appendix B3). The report also includes November 2023 field observations from PG&E biologist Ode Bernstein.

Likelihood of Presence of Special-Status Species

Using the information generated from literature and database reviews, followed by plant and general wildlife field surveys, the list of special-status species with the potential to occur was further refined to reflect the species that may occur within the BSA. The likelihood of special-status species occurrence was determined based on natural history parameters and the species' range, habitat, foraging needs, migration routes, and reproductive requirements using the following general categories:

- **Present—**Wildlife field reconnaissance surveys or rare plant protocol-level surveys documented the occurrence, or the BAHCP shows modeled habitat for the species.
- **High Potential —**The species has a strong likelihood to be found in the BSA prior to or during construction, but it has not been directly observed to date during project surveys. The likelihood that a species may occur is based on the following considerations: (1) suitable habitat that meets the life history requirements of the species is present on or near the BSA; (2) migration routes or corridors are near or within the BSA; (3) records of sighting are documented on or near the BSA; and (4) there is an absence of invasive predators (for example, bullfrogs). The main assumption is that records of occurrence have been documented within or near the BSA, the BSA falls within the range of the species, and suitable habitat is present within the study areas, but it is undetermined whether the habitat is currently occupied.
- **Moderate Potential —**There is a possibility that the species can be found in the BSA prior to or during construction, but it has not been directly observed to date. The likelihood that a species may occur is based on the following conditions: (1) suitable habitat that meets the life history requirements of the species is present on or near the BSA; (2) migration routes or corridors are near or within the BSA; and (3) there is an absence of invasive predators (for example, bullfrogs). The main assumption is that the BSA falls within the range of the species, suitable habitat is present, but no records of sighting are located within or near the BSA and it is undetermined whether the habitat is currently occupied.
- **Low Potential —**The species is not likely to occur in the BSA based on the following considerations: (1) lack of suitable habitat and features that are required to satisfy the life history requirements of the species (for example, absence of foraging habitat, lack of reproductive areas, and lack of sheltering areas); (2) presence of barriers to migration/dispersal; (3) presence of predators or invasive species that inhibit survival or occupation (for example, the presence of bullfrogs or invasive fish); (4) lack of hibernacula, hibernation areas, or estivation areas onsite.
- **Not Expected—**Suitable habitat does not exist in the BSA, the species is restricted to or known to be present only within a specific area outside of the BSA, or, for plants, botanical protocol-level surveys did not detect the species.

Unless otherwise noted, the methodology and environmental information presented in this section are summarized from the Botanical Resources Survey Report, Aquatic Resources Delineation Report, or Wildlife Assessment Report, which are included as Appendices D1, D2, and D3, respectively.

5.4.1.2 Environmental Setting

Regional Setting

The BSA is in the East Bay Hills – Mount Diablo and East Bay Terraces and Alluvium ecological subregions of the Central California Coast section ecological unit (USDA 1997) and is within the San Leandro Creek and Sausal Creek watersheds. The 10 tributary creeks in the San Leandro Creek Watershed drain to Upper San Leandro Reservoir, Lake Chabot, or San Leandro Creek. Within the Sausal Creek Watershed, three main tributaries flow to Sausal Creek, which ultimately drains into the Oakland Estuary (Figure 5.10-2).

Hydrology is influenced by precipitation, surface water runoff, groundwater discharge, geologic stratigraphy, topography, and soil permeability. A total of eight drainages are mapped in the BSA (Sowers et al. 2010), five of which are named and three unnamed. The named drainages from east to west are Moraga Creek, San Leandro Creek, Shephard Creek, Sausal Creek, and Palo Seco Creek (Figure 5.10-2). San Leandro Creek drains the BSA between Gudde Ridge and Manzanita Drive/Skyline Boulevard and flows south-southeast into San Leandro Reservoir. Shephard Creek drains the upper

Berkeley Hills east of SR 13 via Shepherd Canyon and flows southwest into Sausal Creek, which flows into Palo Seco Creek at SR 13. Sausal Creek flows south-southwest out of the Berkeley Hills through Dimond Canyon and ultimately drains into the Oakland Estuary near Alameda Island.

Local Setting

The BSA is located on a combination of open space and parklands and urban development. Land includes PG&E fee and easement property, EBRPD land, EBMUD land, private property, and City of Oakland Parks land between Moraga Substation and Oakland X Substation and includes various access routes that pass through private property (Figure 3.5-1). The project area will be accessed through gates from city streets and unpaved EBRPD and EBMUD trails and access roads. The BSA crosses sections of Huckleberry Botanic Regional Preserve, Sibley Volcanic Regional Preserve, the McCosker sub-area EBRPD parks, and Shepherd Canyon and Dimond Canyon City of Oakland parks. There are two disjunct staging areas in Sibley Volcanic Regional Preserve approximately 2.2 miles west-northwest of Moraga Substation.

The BSA east of Manzanita Drive is dominated by undeveloped open space. The east-facing slopes in this portion of the BSA are dominated largely by grassland and oak woodland vegetation communities, while the shadier canyon bottoms support riparian communities. The BSA west of Manzanita Drive is dominated by residential areas largely surrounded by oak woodland communities with scattered grasslands, with natural areas becoming increasingly fragmented by residences moving west.

Topography and Climate

The elevation in the BSA increases from Moraga Substation up the gentle-to-moderately-steep east-facing slope of Gudde Ridge in the East Bay Hills. It then traverses rolling hills before crossing the deep southeast trending canyon of upper San Leandro Creek, crossing the creek's upper reaches. From Manzanita Drive, the BSA drops down the west-facing slopes of the East Bay Hills, roughly following Dimond Canyon. The staging areas in Sibley Volcanic Regional Preserve are located on gently rounded hills north of Round Top Peak. Elevations in the BSA range from approximately 620 feet near Moraga Substation to approximately 1,360 feet near Manzanita Drive, then dropping westward to approximately 60 feet near Oakland X Substation. The staging areas in Sibley Volcanic Regional Preserve are approximately 1,300 feet in elevation.

The regional climate is characterized by mild winters and hot, dry summers. Average total precipitation is 23 inches (AgACIS 2023). Monthly temperature ranges from 52 degrees Fahrenheit (°F) to 67°F with an annual average temperature of 59.5°F (NOAA 2021).

Land Use

The BSA lies within a network of land uses, including undeveloped EBRPD lands, EBMUD lands, Oakland Parks lands, Montclair Golf Course, Montera Middle School, Corpus Christi School, fee and easement lands, and private residential properties (Figure 5.3-1 and Figure 5.11-2). Multiple paved streets cross the BSA, primarily located west of Manzanita Drive. Much of the undeveloped open space is open to the public for recreational use such as hiking.

Three native plant restoration project sites are present in the BSA: two in Shepherd Canyon and one along the project's walking access along Bridgeview Trail in Dimond Canyon. An unofficial BMX bike park is located near structures EN21 and ES23 immediately north of Oakland Fire Station No. 24 on Shepherd Canyon Road. Cattle graze in eastern portions of EBRPD Huckleberry Botanic Regional Preserve.

5.4.1.3 Vegetation Communities, Land Cover, and Wildlife Habitats

Vegetation mapping is provided within the overall BSA based on the CLN map data, and within the smaller botanical study and survey area, in conjunction with the protocol-level botanical surveys conducted in 2021 within the botanical study and survey area (Section 5.4.1.1.2.1). Vegetation communities in the botanical study and survey area are based on the List of California Vegetation Alliances (Holland 1986) (Table 5.4-2). and classifications presented in the *Manual of California Vegetation* (MCV) (Sawyer et al. 2009) Described broadly, natural communities present in the botanical study and survey area include Non-Native Grassland, Native Grassland, Valley Needlegrass Grassland, Valley Wildrye Grassland, Central Coast Riparian Scrub, Northern Coyote Brush Scrub, Northern Maritime Chaparral, Ruderal, California Bay Forest, Coast Live Oak Woodland, Upland Redwood Forest, Urban Mix, and Freshwater Seep (Table 5.4-2). The more-detailed MCV classification system was used to identify sensitive plant communities (Table 5.4-3, column 2); 9 of the 21 MCV-classified vegetation communities identified in the botanical study and survey area are considered sensitive plant communities (S1 through 3) by CDFW. The locations of these sensitive communities within the botanical field survey area are depicted on Figure 5.4-3. CNDDB Sensitive Natural Communities locations are mapped on confidential Figure 5.4-5c, which is provided under separate cover to the CPUC.

Table 5.4-2. Vegetation Communities Present in the Botanical Study and Survey Area

Vegetation Communities[a] and Land Cover Types	Acreage
Upland Herbaceous Dominated Vegetation Types	
Non-Native Grassland	55.5
Native Grassland	0.3
Valley Needlegrass Grassland	1.9
Valley Wildrye Grassland	0.1
Shrub-Dominated Vegetation Types	
Central Coast Riparian Scrub	0.3
Northern Coyote Brush Scrub	11.1
Northern Maritime Chaparral	2.1
Ruderal	0.1
Woodland and Forest Vegetation Types	
California Bay Forest	3.1
Coast Live Oak Woodland	64.8
Upland Redwood Forest	1.1
Urban Mix	7.9
Wetland Herbaceous Dominated Vegetation Types	
Freshwater Seep	0.1
Other Cover Types	
Construction Site	4.1
Park	3.3
Restoration Site	0.4
Unpaved Roads	8.9
Urban	81.8
Total	**247.0**

[a] Holland (1986)

Acreages reported are based on the botanical study and survey area (Section 5.4.1.1.2.1).

Other land cover types mapped in the botanical study and survey area include Construction Site, Park, Restoration Site, Unpaved Roads, and Urban (Table 5.4-2). Paved surface streets are included in the Urban land cover type.

The CLN 2.0 Vegetation Map was used for the entire BSA. As part of the vegetation mapping effort, a comparison was made between the natural communities as mapped during the 2021 survey effort and the CLN vegetation types (Section 5.4.1.1.2.1). Figure 5.4-3 shows the identified sensitive communities (S1 to S3) within the botanical survey area, identified with bold text in Table 5.4-3, as well as cover types as mapped in the CLN 2.0 Vegetation Map within the BSA, along with temporary and permanent impact areas. Impacts are further tabulated in Section 5.4.4. The CLN mapping was used as the desktop review for the wildlife study area and BSA. Appendix B1 includes a cross-walk table between the different nomenclature systems. Table 5.4-3 presents the vegetation communities and land cover types mapped in the botanical study and survey area using the Holland classification system and for identification of sensitive plant communities, shows the corresponding classifications per MCV, and shows temporary and permanent impact areas. Temporary and permanent impacts within vegetation communities including sensitive natural communities are summarized in the Section 5.4.4.

Descriptions of the vegetation communities present in the botanical study and survey area follow. Several CLN 2.0 vegetation types are also described that are included on Figure 5.4-3 but outside the botanical study and survey area or for which no comparable community was mapped during the 2021 effort. Sensitive natural communities as designated by CDFW are discussed in Section 5.4.1.3.6, shown on Figure 5.4-3, and listed in the second column of Table 5.4-3. Table 5.4.4 shows the acreage of CLN vegetation types within the entire BSA (refer to Figure 5.4-3).

Table 5.4-3. Vegetation Communities Classification/Mapping Comparison

Terrestrial Communities (Holland 1986)	California Vegetation (Sawyer et al. 2009, CDFW 2021a)	CLN 2.0 (BSOSC 2019)
Non-Native Grassland (42200)	*Avena spp*. and *Bromus* spp. Herbaceous Semi-Natural Alliance (Wild Oats and Annual Bromes Grassland) (42.027.00) *Brassica nigra – Centaurea* (*melitensis, solstitialis*) Herbaceous Semi-Natural Alliance (Upland Mustards or Star-Thistle Fields) (42.011.00) *Elymus caput-medusae* Semi-Natural Herbaceous Alliance (Medusahead Grassland) (42.020.00) *Festuca perennis* Herbaceous Semi-Natural Herbaceous Alliance (Perennial Rye Grass Fields) (41.321.00)	Moderate Grasslands, Warm Grasslands
Native Grassland (Holland and Keil 1995)	***Elymus glaucus* Herbaceous Alliance (Blue Wildrye Prairie) (41.131.000) S3**	Moderate Grasslands, Warm Grasslands
Valley Needlegrass Grassland (42110)	***Stipa spp.* Herbaceous Alliance (Needle Grass Grassland) (41.140.00) S3**	Moderate Grasslands, Warm Grasslands
Valley Wildrye Grassland (42140)	***Elymus triticoides* Herbaceous Alliance (Creeping Ryegrass Turfs) (41.081.00) S3**	Moderate Grasslands, Warm Grasslands
Central Coast Riparian Scrub (63200)	***Salix lasiolepis* Shrubland Association (Arroyo Willow Thickets) (61.201.01) S3**	Riparian Mixed Hardwood
Northern Coyote Brush Scrub (32110)	*Baccharis pilularis* Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	Coyote Brush
Northern Maritime Chaparral (37C10)	***Arctostaphylos crustacea* Shrubland Alliance (Brittle Leaf Manzanita Chaparral) (37.308.00) S3** *Rubus* (*parviflorus, ursinus*) Shrubland Alliance (Berry Brambles) 63.901.00	--
Ruderal (Holland and Keil 1995)	*Genista monspessulana* Semi-Natural Shrubland Alliance (Broom Patches) (32.180.01)	--
California Bay Forest (81200)	***Umbellularia californica* Forest Alliance (California Bay Forest) (74.100.00) S3**	California Bay, Coastal Mixed Hardwood, Interior Mixed Hardwood

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 5.4-3. Vegetation Communities Classification/Mapping Comparison

Terrestrial Communities (Holland 1986)	California Vegetation (Sawyer et al. 2009, CDFW 2021a)	CLN 2.0 (BSOSC 2019)
Coast Live Oak Woodland (71160)	*Quercus agrifolia* Woodland Alliance (Coast Live Oak Woodland) (71.060.00)	Coast Live Oak, Coastal Mixed Hardwood, Interior Mixed Hardwood
Upland Redwood Forest (82320)	***Sequoia sempervirens* Forest Alliance (Redwood Forest) (86.100.00) S3**	Redwood
Urban Mix (Holland and Keil 1995)	*Eucalyptus* spp. Woodland Semi-Natural Alliance (Eucalyptus Groves) (79.100.02) *Pinus radiata* Woodland Semi-Natural Alliance (Monterey Pine Plantations) (87.240.04)	Non-Native/ Ornamental Conifer/Hardwood; Eucalyptus
Freshwater Seep (45400)	***Carex densa* Provisional Herbaceous Alliance (Dense Sedge Marshes) (45.165.00) S2?** ***Mimulus guttatus* Herbaceous Alliance (Common Monkey Flower Seep) (44.111.01) S3** *Juncus balticus* Herbaceous Alliance (Baltic Rush Marshes) (45.562.00)	--
Construction Site Park (not described)	Not Described	Urban/Developed (General)
Urban (Not Described)	Not Described	Urban/Developed (General); Non-Native/Ornamental Grass; Non-Native/Ornamental Conifer/Hardwood

Communities in **bold** in center column are sensitive natural communities (rank S1 to 3).

Table 5.4-4. CLN Vegetation Communities Present in the BSA

Vegetation Communities[a] and Land Cover Types	Acreage
Blue Oak	38.7
California Bay	9.3
Chamise	4.4
Coast Live Oak	571.0
Coastal Mixed Hardwood	31.3
Coyote Brush	4.4
Eucalyptus	199.3
Interior Mixed Hardwood	4.9
Moderate Grasslands	489.9
Non-Native/Ornamental Conifer/Hardwood	59.8
Non-Native/Ornamental Grass	1.0
Redwood	38.8
Riparian Mixed Hardwood	4.9
Serpentine Conifer	0.2
Serpentine Hardwood	0.1
Unpaved Roads	8.9
Urban/Developed (General)	975.2

Table 5.4-4. CLN Vegetation Communities Present in the BSA

Vegetation Communities[a] and Land Cover Types	Acreage
Warm Grasslands	34.9
Total	**2,477.0**

[a] CLN 2.0 (BSOSC 2019)
Acreages reported are based on the BSA (Section 5.4.1.1.1).

Upland Herbaceous Vegetation Types

Four upland herbaceous vegetation types classified following Holland's Terrestrial Communities were observed; the majority is non-native grassland, with some native grassland, valley needle grass grassland, and valley wildrye grassland. These communities are found in the first column of Table 5.4-3. To identify sensitive vegetation communities, refer to the S1 to 3 annotations in the second table column in bold (refer to sensitive vegetation communities on Figure 5.4-3).

Non-Native Grassland

Non-native grassland is dominated by a sparse to dense cover of non-native grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, that replaced native perennial grasslands as a result of human disturbance. However, where not completely outcompeted by weedy non-native plant species, scattered native wildflower species and native perennial grass species considered remnants of the original vegetation also may be common. Non-native grassland mostly occurs in the botanical study and survey area east of the San Leandro Creek canyon and at the staging areas in Sibley Volcanic Regional Preserve. Smaller polygons occur in a fragmented nature west of Manzanita Drive. Non-native grasslands readily intergrade with the understories of coast live oak woodland, northern coyote brush scrub, and urban mix communities in the botanical study and survey area. Some of the herbaceous species present in non-native grassland in the botanical study and survey area include soft chess (*Bromus hordeaceus*), slender wild oats (*Avena barbata)*, wild oats (*A. fatua*), Italian wildrye (*Festuca perennis*), field madder (*Sherardia arvensis*), dogtail grass (*Cynosurus echinatus*), medusahead (*Elymus caput-medusae*), rough cat's ear (*Hypochaeris radicata*), yarrow (*Achillea millefolium*), blue wildrye (*Elymus glaucus subsp. glaucus*), purple needlegrass (*Stipa pulchra*), Kellogg's yampah (*Perideridia kelloggii*), wild radish (*Raphanus sativus*), black mustard (*Brassica nigra*), and yellow star-thistle (*Centaurea solstitialis*), among others. While generally dominated by non-native species, areas with moderate native integrity are present throughout this community. Coyote brush (*Baccharis pilularis* subsp. *consanguinea*) is invading many areas of non-native grassland in the botanical study and survey area.

Native Grassland

Native grassland is restricted to the eastern portion of the botanical study and survey area, where it occurs near the staging area by the community of Wilder and on the east-facing slopes of Gudde Ridge. These areas are dominated by blue wildrye with other species present, including hayfield tarweed (*Hemizonia congesta* var. *luzulifolia*), rough cat's ear, California poppy (*Eschscholzia californica*), yarrow, bull thistle (C*irsium vulgare*), teasel (*Dipsacus sativus*), and California plantain (*Plantago erecta*).

The native grassland identified falls within the blue wildrye MCV alliance, which is a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009).

Valley Needlegrass Grassland

Valley needlegrass grassland is dominated by perennial, tussock-forming needlegrass species (*Stipa* spp.), with native and introduced annual species occurring in the areas between needlegrass tussocks. Within the botanical study and survey area, valley needlegrass grasslands occur in a patchy distribution throughout the larger matrix of non-native grassland. They tend to be impacted by non-native species but retain moderate to high levels of native integrity and a characteristic dominance by purple needlegrass and nodding needlegrass (*Stipa cernua*). Dominant species include purple needlegrass and nodding needlegrass, with other herbaceous species present, including California melic (*Melica californica*), California plantain, hayfield tarweed, slender tarweed (*Madia gracilis)*, California poppy, rose clover (*Trifolium hirtum*), slender wild oats, and bellardia (*Bellardia trixago*). Low amounts of shrub cover, including silver bush lupine (*Lupinus albifrons* var. *albifrons*) and coyote brush, were observed in this community in the botanical study and survey area.

The valley needle grass grassland identified in the field corresponds to the needle grass grassland as classified using MCV (second column in Table 5.4-3) and is a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009).

Valley Wildrye Grassland

Valley wildrye grassland is a dense sod prairie dominated by creeping wildrye (*Elymus triticoides*). Within the botanical study and survey area, valley wildrye grassland is restricted to one occurrence just west of Moraga Substation on a gentle east-facing slope nestled against coast live oak woodland. The dominant species is creeping wildrye, with other species present in lower numbers, including Kellogg's yampah, soaproot (C*hlorogalum pomeridianum subsp. pomeridianum*), and sapling coast live oak (*Quercus agrifolia var. agrifolia*). Very sparse cover of sapling coast live oak and poison oak were observed in this community.

This grassland corresponds to the creeping ryegrass turfs, which are a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009).

Shrub-Dominated Vegetation Types

Four shrub-dominated vegetation types were identified: central coast riparian scrub, northern coyote brush scrub, northern maritime chaparral, and ruderal scrub.

Central Coast Riparian Scrub

Central coast riparian scrub is a scrubby streamside thicket, varying from open to impenetrable, dominated by any of several willow species (*Salix* spp.) (Holland 1986). It is distributed along most perennial and many intermittent streams of the South Coast ranges. In the botanical study and survey area, this community is restricted to a mesic depression in Shepherd Canyon and an area where the access road to the staging area near Wilder crosses an ephemeral drainage. It is dominated by arroyo willow (*Salix lasiolepis*) in the shrub layer with poison oak present and low cover of California bay *(Umbellularia californica*). The herbaceous layer was largely absent, although mugwort (*Artemisia douglasiana*), tall flatsedge (*Cyperus eragrostis*), Harding grass (*Phalaris aquatica*), and small amounts of creeping wildrye are present at the edges of this community.

The central coast riparian scrub identified here corresponds to the MCV Arroyo Willow Thickets, which is a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009) (Table 5.4-3, column 2).

Northern Coyote Brush Scrub

Northern coyote brush scrub is a cover type of northern coastal scrub based on the dominance of coyote brush (Holland 1986). This community comprises low shrubs, typically dense but with scattered grassy openings. Northern coyote brush scrub is found in the botanical study and survey area east of the San Leandro Creek canyon as well as at the staging areas at Sibley Volcanic Regional Preserve. It is dominated by coyote brush in the shrub layer with other shrubby species present, including poison oak, California sagebrush (*Artemisia californica*), California coffeeberry (*Frangula californica* ssp. *californica)*, bush monkeyflower (*Diplacus aurantiacus*), and French broom (*Genista monspessulana*). The herbaceous layer varies from sparse to dense and includes California bee plant (*Scrophularia* *californica*), climbing bedstraw (*Galium porrigens* var. *porrigens*), California manroot (*Marah fabaceus*), soaproot, ladies tobacco (*Pseudognaphalium californicum*), common phacelia (*Phacelia distans*), hoary mustard (*Hirschfeldia incana*), and California broom (*Acmispon glaber* var. *glaber*), among others. In some areas, it is co-dominant with California sagebrush and/or poison oak. Sapling coast live oak are often present in low numbers.

Northern Maritime Chaparral

Northern maritime chaparral is a fairly open chaparral that is dominated by several narrowly restricted manzanita *(Arctostaphylos* spp.) or ceanothus (*Ceanothus* spp.) species (Holland 1986). Within the botanical study and survey area, northern maritime chaparral is uncommon and is found only on east-facing slopes immediately east of Manzanita Drive, where it often occurs as islands in the larger coast live oak woodland community. Where observed, it is dominated by brittle leaf manzanita (*Arctostaphylos crustacea* subsp. *crustacea*), pallid manzanita (*A. pallida*), California blackberry, oso berry (*Oemleria cerasiformis*), and California huckleberry (*Vaccinium ovatum*), with other native shrub species present, including low numbers of jim brush (*Ceanothus oliganthus* var. *sorediatus*), coast silktassel (*Garrya elliptica*), and red flowering currant (*Ribes sanguineum* var. *glutinosum*). It varies in shrub density, with manzanita species, when present, often forming impenetrable thickets with essentially no herbaceous layer. Immediately under the power lines east of Manzanita Drive, the shrub layer is more open, lacks manzanita species, and has a more robust herbaceous layer. Evidence of tree removal was observed in this area, which may contribute to the persistence of this community. Emergent trees were present in low cover, often in the form of stump sprouts; coast live oak, California bay, and bluegum (*Eucalyptus globulus*) were observed encroaching on this community.

Northern maritime chaparral within the botanical study and survey area is characterized as two MCV alliances: *Arctostaphylos crustacea* Shrubland Alliance (Brittle Leaf Manzanita Chaparral), a sensitive plant community, and *Rubus (parviflorus, ursinus)* Shrubland Alliance (Berry Brambles) which is not sensitive. All stands of pallid manzanita observed in the botanical study and survey area are included in the *Arctostaphylos pallida* Provisional Special Stands nested under the brittle leaf manzanita chaparral alliance. Brittle leaf manzanita chaparral is a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009).

Ruderal

Ruderal communities comprise plants that thrive in waste areas, roadsides, or other disturbed sites near urban areas (Holland and Keil 1995). These communities can contain ornamental species that have escaped cultivation. It is not uncommon for most species in these communities to be introduced rather than native, although there may be remnant native species that intergrade with this vegetation community. Within the botanical study and survey area, ruderal communities were uncommon. Ruderal communities observed are dominated in the shrub layer by French broom with small amounts of coyote brush and poison oak present. The herbaceous layer consists of mostly non-native annual grass species and other forbs, including hedge parsley (*Torilis arvensis*), ladies' tobacco, climbing bedstraw, and Pacific sanicle (*Sanicula crassicaulis*). Emergent trees are often present in low cover. Where observed, these communities are invading grassland habitats and encroaching on adjacent coast live oak woodland and northern maritime chaparral communities.

Woodland and Forest Vegetation Types

Four woodland and forest vegetation types were observed: California bay forest, coast live oak woodland, upland redwood forest, and urban mix.

California Bay Forest

As described by Holland (1986), this community is similar to mixed evergreen forest, but typically consists entirely of California bay, a broadleaved sclerophyllous tree that grows up to 98 feet tall. It often forms dense, wind-pruned stands less than 33 feet tall on exposed coastal slopes. Within the botanical study and survey area, California bay forest is present along the access roads leading to the community of Wilder, in the San Leandro Creek canyon bottom and banks, and in the Sausal Creek Canyon bottom and dominated by California bay in the overstory. The shrub layer is sparse and consists of snowberry (*Symphoricarpos albus* subsp. *laevigata*), California hazelnut, California blackberry, poison oak, and English ivy (*Hedera helix*). The herbaceous layer is similarly sparse and consists of sword fern (P*olystichum munitum*), wood fern (*Dryopteris arguta*), giant trillium (*Trillium chloropetalum*), woodland madia (*Anisocarpus madioides*), woodland brome (*Bromus laevipes*), and California manroot. The stand in the Sausal Creek Canyon is heavily invaded by English ivy, which comprises almost the entirety of understory cover.

This community corresponds to MCV's California bay forest and is a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009).

Coast Live Oak Woodland

Coast live oak woodland is typically dominated by one tree species, coast live oak, which is evergreen and reaches 33 to 82 feet. The shrub layer is poorly developed, but may include toyon, gooseberry (*Ribes* spp.), and blue elderberry. The herb component is continuous and dominated by non-native annual grasses. This community typically occurs on north-facing slopes and shaded ravines in the south and more exposed sites in the north. Coast live oak woodland is one of the most widespread communities in the botanical study and survey area, with larger polygons occurring east of Manzanita Drive and more fragmented polygons west of Manzanita Drive. Tree canopy is largely dominated by coast live oak, with California bay, California buckeye (*Aesculus californica*), or other tree species often being co-dominant. Shrub layer varies from sparse to dense and includes poison oak, coyote brush, French broom, snowberry, and California hazelnut, among others. The herbaceous layer varies from dense to open and includes species such as Pacific sanicle, soaproot, wood fern, rough hedgenettle (*Stachys rigida* var. *quercetorum*), hedge parsley, wood rush (*Luzula comosa* var. *comosa*), blue wildrye, and a variety of non-native annual grasses. West of Manzanita Drive, the residential areas classified as urban generally occur within a larger matrix of coast live oak woodland but are characterized by heavy anthropogenic influences, including tree trimming, understory management, and landscaping.

Upland Redwood Forest

Holland (1986) describes upland redwood forest as a moderately dense forest dominated by coast redwood (*Sequoia sempervirens*) that are approximately 262 feet in height. Growth is often limited by drought in summer and fall. This community grows within reach of summer fogs, with inland and upper altitudinal ranges possibly limited by this factor. It occurs on shallow, well-drained soils, often on steep slopes subject to erosion. It is confined to north exposures and canyon bottoms near the interior and southern margins of the range and is often subject to infrequent and devastating fires. Upland redwood forest is present in the botanical study and survey area in Dimond Canyon and Shepherd Canyon. It is dominated by coast redwood in the tree canopy with California bay and madrone present in the secondary canopy. The shrub layer is largely absent and where present is made up of sapling coast redwood and California bay. The herbaceous layer is sparse and includes redwood sorrel (*Oxalis oregana*), crimson woodsorrel (*Oxalis incarnata*), panic veldt grass (*Ehrharta erecta*), and sword fern. It is unclear if the upland redwood forest polygons in Shepherd Canyon are remnant native forest or historic plantings, but they retain aspects of native forest and are mapped as such here. In Dimond Canyon, outplantings of native herbaceous species, including redwood sorrel and alum root (*Heuchera micrantha*), were observed in upland redwood forest. Upland redwood forest is a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009).

Urban Mix

Urban mix is characterized as areas where non-native plants have either escaped or been ornamentally planted for uses such as windrows in areas around urban or residential developments (Holland and Keil 1995). In open areas surrounded by development, it is not uncommon to find mixtures of non-native and native vegetation. Common examples of non-native plants found in urban mix include eucalyptus species (*Eucalyptus* spp.), Monterey cypress *(Hesperocyparis macrocarpa*), Monterey pine (*Pinus radiata*), and acacias (*Acacia* spp.), along with many non-native shrubs, perennials, and ornamental vines. Within the botanical study and survey area, urban mix occurs along the ridge near Manzanita Drive, as well as in scattered polygons throughout Shepherd Canyon and Dimond Canyon. Most polygons are dominated by bluegum with Monterey pine, Monterey cypress, and acacia species present and often co-dominant. A monotypic stand of Monterey pine is located just south of Moraga Substation along the urban interface. The shrub layer varies from dense to open and consists of coyote brush, poison oak, snowberry, and French broom. The herbaceous layer is sparse to continuous and consists of mostly non-native species, although native species such as blue wildrye, soaproot, and Pacific sanicle are often present. Pallid manzanita occurs in the understory of urban mix in one location where the urban mix has encroached on northern maritime chaparral near The Hills Swim Club.

Additional Conservation Lands Network 2.0 Vegetation Types

Three CLN 2.0 vegetation types, blue oak, serpentine conifer, and serpentine hardwood, are mapped in the literature in the 1,000-foot buffer BSA, but none of these three vegetation types were found during the 2021 survey effort within the smaller botanical survey area. Blue oak vegetation type consists of dense to open, nearly pure stands of blue oak with a largely grassland understory. No blue oaks were observed during the 2021 survey effort. Serpentine conifer and serpentine hardwood are characterized by conifers and hardwood types (oaks and others), respectively, on serpentine rock. Because no serpentine habitats were observed during the 2021 site visit, these vegetation types were not mapped in the botanical study and survey area.

Wetland Herbaceous Dominated Vegetation Types

A single wetland herbaceous vegetation type was observed in the eastern portion of the botanical study and survey area: freshwater seeps, as shown on Figure 5.4-3.

Freshwater Seeps

As described in Holland (1986), freshwater seeps comprise mostly perennial herbs, namely sedges (*Carex* spp.) and grasses (Poaceae), often forming total cover. This community generally occurs on permanently moist or wet soil around freshwater seeps that often are associated with grasslands or meadows. Although uncommon in the deserts, freshwater seeps are scattered through most regions of California, but are found most commonly in grassland habitats.

Freshwater seeps are restricted to four small polygons, all located in the eastern portion of the botanical study and survey area. They all occur as small islands within larger non-native grassland, coast live oak woodland, and northern coyote brush scrub communities. Characteristic species include dense sedge (C*arex densa*), common monkeyflower *(Mimulus guttatus*), Baltic rush (*Juncus balticus* subsp. *ater)*, Pacific rush (*Juncus effusus* subsp. *pacificus*), rabbitsfoot grass (*Polypogon monspeliensis*), Italian wildrye, and tall flatsedge. There is an overhanging tree layer present from adjacent oak woodland communities and encroaching coyote brush was present at two locations. Freshwater seeps observed in the botanical study and survey area generally were associated with springs and had saturated soil or standing water throughout the surveyed area.

Freshwater seeps within the botanical study and survey area are characterized as at least three MCV alliances: *Carex densa* Provisional Herbaceous Alliance (Dense Sedge Marshes), *Mimulus guttatus* Herbaceous Alliance (Common Monkey Flower Seep), and *Juncus balticus* Herbaceous Alliance (Baltic Rush Marshes). Dense sedge marshes are a sensitive vegetation community with a rarity ranking of S2?[16] (Sawyer et al. 2009), and common monkey flower seeps are a sensitive vegetation community with a rarity ranking of S3 (Sawyer et al. 2009) (refer to Figure 5.4-3).

[16] A question mark (?) denotes an inexact numeric rank because there are insufficient samples over the full expected range of the type, but existing information points to this rank (NatureServe 2021).

Other Land Cover Types

Five other land cover types were included for the project: construction site, landscaped parks, restoration site, unpaved roads, and urban (Appendix B1).

Construction Site

Within the botanical study and survey area, the area north of Pinehurst Road at Wilcox Staging Area in Sibley Botanic Regional Preserve is undergoing active construction by EBRPD. Activities observed include excavation, drainage restructuring, building construction, and storage of heavy machinery and construction supplies. This area is currently not providing any natural habitat and does not conform to any of the vegetation communities described previously; as such it is not included in any of them. The construction site is comparable to CLN 2.0 urban/developed (general) vegetation type.

Parks

Parks consist of landscaped recreation areas where sod dominates and picnic tables, restrooms, or other publicly accessible services are available. They may contain ruderal weeds but provide little to no habitat for special-status species. Within the botanical study and survey area, Shepherd Canyon Park, sports fields, and golf courses are classified as Parks. Parks are comparable to CLN 2.0 urban/developed (general) vegetation type.

Restoration Site

Three community-sponsored native plant restoration sites (two in Shepherd Canyon and one in Dimond Canyon) are dominated by native plant species and provide valuable ecosystem services for common wildlife. However, these areas do not provide habitat for special-status plant species because of their fill soils and garden-like nature. These landscaped restoration sites are comparable to CLN 2.0 urban/developed (general) vegetation type.

Unpaved Roads

Unpaved roads found within the BSA do not provide habitat for native vegetation and special-status species.

Urban

The urban landcover type is residential and commercial areas and paved streets and parking lots. In the botanical study and survey area, urban land types are dominant east of Manzanita Drive. The vegetation communities on residential properties may support native vegetation but are dominated by landscaped yards. Although coast live oak trees are prevalent in urban areas between Manzanita Drive and SR 13, they provide little to no natural habitat and were classified as urban in these locations. Urban areas are comparable to CLN 2.0 non-native/ornamental grass, non-native/ornamental conifer/hardwood, and urban/developed (general) vegetation types.

Sensitive Natural Communities

Natural communities with ranks of S1, S2, and S3 are considered sensitive natural communities to be addressed (CDFW 2021a). During the 2021 botanical surveys, a total of nine sensitive natural communities currently recognized by CDFW, corresponding to seven mapped vegetation communities, were observed in the botanical study and survey area. These communities are described in the previous subsections. These communities and their conservation status rank appear in Table 5.4-3, shown in bold in the middle column (Section 5.4.1.3). The locations of these communities are depicted on Figure 5.4-3.

5.4.1.4 Wetlands and Other Aquatic Resources

Aquatic resources observed along the power lines mostly occur along access routes; however, several aquatic resources were identified adjacent to or within proposed work areas (Figure 5.4-4 and Appendix B2). The aquatic resource delineation identified five wetlands in the aquatic study and survey area comprising approximately 0.13 acre. In addition, approximately 0.36 acre (approximately 1,748 linear feet) of riverine-intermittent waters, approximately 0.029 acre (approximately 411 linear feet) of riverine-ephemeral waters were identified and mapped as Other Waters on Figure 5.4-4. Approximately 1,514 linear feet of culverted waters were identified in the aquatic study and survey area.

Wetlands

Five wetlands were delineated within the aquatic study and survey area. A wetland complex consisting of three separate features (W-01a, W-01b, and W-01c) was delineated along Edgewood Road east of the proposed staging area on Wilder Road. These wetlands are formed from groundwater discharge at the base of a hillslope. Local topography is flat to slightly concave. Two wetlands (W-02 and W-03) were delineated on hillslopes adjacent to the proposed staging area just southeast of power line pole ES8A&B. Wetland hydrology appeared to be associated with hillslope seeps (Section 5.4.1.3.4). The local topography was flat to slightly convex. A total of approximately 0.133 acre of wetlands was delineated within the aquatic study and survey area. All delineated wetlands appeared to be isolated wetlands without direct surface connection to any waters of the United States. Therefore, W-01a, W-01b, W-01c, W-02, and W-03 are potentially waters of the State and unlikely to be waters of the U.S.

Other Aquatic Features

Riverine – Intermittent

Ten intermittent drainages were delineated within the aquatic study and survey area. A break in the bank slope and changes in species cover and composition were the most common indicators of the ordinary high water mark used in the delineation (Lichvar and McColley 2008). One of the intermittent drainages, Alder Creek, was recently daylighted and restored on EBRPD property along Fire Trail 61-16 off Pinehurst Road. Intermittent drainages delineated within the aquatic study and survey area total approximately 0.357 acre and approximately 1,750 linear feet. All delineated Riverine Intermittent features are both waters of the U.S. and waters of the State.

Riverine – Ephemeral

Five ephemeral drainages were delineated within the aquatic study and survey area. Ephemeral drainages cross many parts of the aquatic study and survey area, draining water from surrounding hillslopes in the upper watersheds. Ephemeral flow regime was distinguished from intermittent flow regime primarily based on stream order, channel slope, and presence/absence of flow following recent storm events. Ephemeral drainages delineated within the aquatic study and survey area total approximately 0.029 acre and approximately 465 linear feet. All delineated Riverine Ephemeral features are potentially waters of the State and unlikely to be waters of the U.S. based on the updated definition of tributaries defined as relatively permanent, standing, or continuously flowing bodies of water.

Culverted Waters

"Culverted waters" are piped connections between upstream and downstream segments of potentially jurisdictional waters. Ten culverted water features were mapped within the aquatic study and survey area. These features convey potential waters of the U.S. under roadways and access routes. A total of 1,514 linear feet of culverted waters were delineated within the aquatic study and survey area. CW-6 is the only culverted water that is potentially water of the State and unlikely to be water of the U.S. since it only conveys water flow into R-7, which is an ephemeral feature.

5.4.1.5 Special-Status Plant and Wildlife Species and Habitats

The CNDDB, CNPS, and USFWS database searches identified 93 special-status species within approximately 5 miles of the BSA, including 62 special-status plant species and 31 special-status wildlife species (Section 5.4.1.1.1; Appendix B4 and Appendix B5). CNDDB occurrence records are listed and USFWS critical habitat are shown on Figures 5.4-5a and 5.4-5b. Confidential version of Figures 5.45a and 5.4-5b with occurrence locations are confidential and are provided under separate cover to the CPUC. USFWS-designated critical habitat for Alameda whipsnake (*Masticophis lateralis euryxanthus*) (AWS) is present within the BSA (Section 5.4.1.6 and Figure 5.4-6).

This section describes special-status plant species observed (present) during botanical field surveys and, for wildlife, also includes any species considered likely to occur, that have potential to occur, or that are seasonally present in the BSA. Special-status species that are unlikely to be found in the BSA are not discussed in this section but are included in Appendix B3. For plant species, given protocol-level surveys were conducted, only plants found within the botanical survey area are described in detail in this section; others with potential to occur but not found are described in Appendix B3.

Special-status Plant Species

In the CNDDB, USFWS, and CNPS records searches, a total of 62 special-status plant species were identified. Twelve of these species were determined to have moderate to high potential to occur in the BSA based on the presence of potentially suitable habitat and known occurrences in the vicinity. Two special-status plant species were observed in the botanical study and survey area during the 2021 botanical surveys, including one federal- and state-listed species, pallid manzanita (*Arctostaphylos pallida*) and one CRPR 1B.2 species, Jepson's button thistle (*Eryngium jepsonii*). One CRPR 4 species, Oakland star-tulip (*Calochortus umbellatus*), also was found.

Plant species with moderate to high potential to occur were targeted during the protocol-level rare plant surveys (Section 5.4.1.1.2.1). Details including listing status and potential for occurrence of the special-status species are presented in Table 5.4-5. These species are described in further detail in Appendix B1; plants found within the area are also described further in the following subsections. The remaining species were eliminated from further consideration because their required soil types do not occur in the project area, the project area is outside of the species' elevation range, or they were not observed within areas of suitable habitat during appropriately timed botanical surveys within the botanical study and survey area. These species are described in Appendix B1.

Three special-status plant species, pallid manzanita (federal and state listed), Jepson's button thistle (CNPS List 1b), and Oakland star-tulip (CNPS List 4), were found within the botanical study and survey area. The locations of the plant species observed during the botanical survey and CNDDB Sensitive Natural Communities are shown on Figure 5.4-5c, a confidential figure provided under separate cover to the CPUC. Refer to Figure 5.4-5b for a list of species observed during the project botanical survey and the CNDDB Sensitive Natural Communities within 5 miles of the project.

Based on a nine-quadrangle search around the project area, two moss species are known from the region: slender silver moss (*Anomobryum julaceum;* CRPR 4.2) and minute pocket moss (*Fissidens pauperculus;* CRPR 1B.2). Regionally, slender silver moss distribution occurs in hotter, drier areas farther inland (Mount Diablo and Mayacamas Mountains) (CNDDB 2024) compared to the study area; it was not expected to occur and, therefore, was not considered a target of protocol-level rare plant surveys. Locally, minute pocket moss occurs on the west side of the Oakland/Berkeley Hills where summer fog occurs most regularly. Although a portion of the study area is located west of this divide, the locations of protocol-level surveys were in the project alignment, on ridge tops in full sun or partial shade conditions. Minute pocket moss requires habitat of flooded rocks, often in rapidly flowing streams and on wet rock walls of streams and seeps. This type of habitat was not available in this portion of the study area and, therefore, minute pocket moss was not expected to occur and not considered a target of protocol-level rare plant surveys (Norris and Shevock 2004).

Federal- and State-listed Plant Species

Pallid Manzanita

Pallid manzanita is a perennial shrub federally listed as threatened under the FESA, and state-listed as endangered under the CESA, and it has a CRPR of 1B.1 (rare and seriously endangered in California). This species has a blooming period ranging from December through March (CNPS 2021). Pallid manzanita is strongly associated with siliceous substrates that are sandy or gravelly in broadleafed upland forest, closed-cone forest, chaparral, cismontane woodland, and coastal scrub. It is a California endemic known from Alameda and Contra Costa counties from 605 to 1,525 feet in elevation.

One population of 35 individuals of pallid manzanita was observed within the botanical study and survey area during the 2021 botanical field survey. This population is part of a previously described CNDDB record dating from at least 1923 (Occurrence #4) (CDFW 2021b). The population includes four colonies near Manzanita Drive. Surrounding habitat is coast live oak woodland and northern maritime chaparral, with urban mix community species growing in the shrub layer.

California CNPS Rare Plant Rank 1 to 4 Species

Jepson's Button Thistle

Jepson's button thistle is a perennial herb with a CRPR of 1B.2 that blooms from April to August (CNPS 2021). Jepson's button thistle occurs on clay substrates in vernal pools and valley and foothill grassland.

During the 2021 survey, one population of 69 individuals of Jepson's button thistle was observed within the botanical study and survey area. There is no record of this occurrence in the CNDDB. This population is located approximately 1.1 miles south of a known CNDDB record (Occurrence #7) which is a non-specific record with location given as Orinda Park (CDFW 2021b). The population identified during the survey consists of a single colony located within 0.25 mile of Moraga Substation. Habitat is clay soils in non-native grassland and bare areas adjacent to northern coyote brush scrub. Associated species included coyote brush, poison hemlock (*Conium maculatum*), Kellogg's yampah, Italian thistle, California blackberry, bristly ox-tongue (*Helminthotheca echioides*), hedge parsley, and non-native annual grasses. The majority of the Jepson's button thistle were flowering at the time of the survey.

Oakland Star-Tulip

Oakland star-tulip is in the lily family (*Liliaceae*) and has a CRPR of 4.2 – watch list. Its white or pale pink-lilac flowers bloom typically from March to May. It occurs in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland, often on serpentine substrates (CNPS 2021).

During the 2021 survey, one population of 73 Oakland star-tulip individuals was observed within the study area. It is unknown if this population has previously been recorded as spatial distribution of CRPR List 4 species is not tracked by CNDDB. The population comprised one colony growing in an opening near two project power line structures east of Mountain Boulevard near SR 13. It was observed growing in valley needlegrass grassland on the upper slopes of a steep west-facing slope and on the flat areas at the top of the slope. It was growing with California poppy, bedstraw (*Galium aparine*), spring vetch (*Vicia sativa* subsp. *nigra*), narrow leaved miner's lettuce (*Claytonia parviflora* subsp. *parviflora*), California fuschia (*Epilobium canum* subsp. *canum*), nodding needlegrass (*Stipa cernua*), and many-stemmed gilia (*Gilia achilleifolia* subsp. *multicaulis*), among others. There was no shrub or tree layer present.

Table 5.4-5. Special-Status Plant Species with Potential to Occur in the BSA

Scientific Name/ Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
	Federal	State	CNPS			
Amsinckia lunaris bent-flowered fiddleneck	-	-	1B.2	Cismontane woodland, and valley and foothill grassland.	March to June	**High.** Quality habitat exists throughout the BSA. There are several CNDDB occurrences within 5 miles of the BSA; the closest (Occurrence #8, 2007) is located approximately 0.13 mile south of the isolated staging areas. However, this species was not observed during the seasonally appropriate botanical surveys.
Androsace elongata subsp. *acuta* California androsace	-	-	4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley and foothill grassland.	March to June	**Moderate.** Quality habitat exists in areas of thin soils and exposed rock outcrops in the BSA. The nearest herbarium collection is from a 1902 Tracy specimen from the Berkeley Hills in Alameda County (Accession #UC35150). However, this species was not observed during the seasonally appropriate botanical surveys.
Arctostaphylos pallida pallid manzanita	FT	SE	1B.1	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub. Grows on uplifted marine terraces on siliceous shale or thin chert. May require fire.	December to June	**Present.** Four colonies were observed along and adjacent to Manzanita Drive and Huckleberry Botanic Regional Preserve during the seasonally appropriate botanical surveys. This occurrence is associated with multiple collections dating from at least 1923 (Occurrence #4; CDFW 2021b).
Balsamorhiza macrolepis big-scale balsamroot	-	-	1B.2	Chaparral, cismontane woodland, valley and foothill grassland.	March to June	**Moderate.** Quality habitat exists throughout the BSA. There is a CNDDB occurrence within 10 miles of the BSA; the closest (Occurrence #2, 2002) is located approximately 8 miles south. However, this species was not observed during the seasonally appropriate botanical surveys.
Calochortus umbellatus Oakland star-tulip			4.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland, often on serpentine substrates	March to May	**Present.** One population of 73 individuals found near SR 13.
Dirca occidentalis Western leatherwood	-	-	1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast coniferous forest, riparian forest, and riparian woodland.	January to March (April)	**High.** Quality habitat exists throughout the BSA. A CNDDB occurrence (Occurrence #13, 2021) is located on the east-facing slopes to the east of Manzanita Drive in the Huckleberry Botanical Regional Preserve. However, this species was not observed during the seasonally appropriate botanical surveys.

Table 5.4-5. Special-Status Plant Species with Potential to Occur in the BSA

Scientific Name/ Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
	Federal	State	CNPS			
Eryngium jepsonii Jepson's button thistle	-	-	1B.2	Valley and foothill grassland. Vernal pools.	April to August	**Present.** One colony was observed west of Moraga Substation during the seasonally appropriate botanical surveys. This occurrence represents a previously unrecorded population.
Fritillaria liliacea fragrant fritillary	-	-	1B.2	Coastal scrub, valley and foothill grassland, and coastal prairie. Often on serpentine. Various soils usually reported though clay and in grassland.	February to April	**High.** Quality habitat exists throughout the BSA. An undated, presumed extant CNDDB occurrence (Occurrence #66) overlaps the project area. However, this species was not observed during the seasonally appropriate botanical surveys.
Heliathella castanea Diablo helianthella	-	-	1B.2	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, and riparian woodland. Valley and foothill grassland.	March to June	**High.** Quality habitat exists throughout the BSA. There are several CNDDB occurrences within 5 miles of the BSA; the closest (Occurrence #102, 2014) located approximately 1.5 miles north of the project. However, this species was not observed during the seasonally appropriate botanical surveys.
Holocarpha macradenia Santa Cruz tarplant	FT	SE	1B.1	Coastal prairie, coastal scrub, valley and foothill grassland.	June to October	**Low to Moderate.** Quality habitat exists throughout the BSA. There is a CNDDB occurrence within 10 miles of the BSA; the closest (Occurrence #28, 2009) is located approximately 8.5 miles north. However, this species was not observed during the seasonally appropriate botanical surveys.
Leptosiphon aureus bristly leptosiphon	-	-	4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland.	April to July	**Moderate.** Quality habitat exists in areas of thin soils and exposed rock outcrops in the BSA. The nearest record is from a population at Knowland Park in Oakland less than 5 miles from the BSA. However, this species was not observed during the seasonally appropriate botanical surveys.
Meconella oregana Oregon meconella	-	-	1B.1	Coastal prairie and coastal scrub. Open, moist places.	March to April	**Moderate.** Some suitable habitat exists in the BSA. A CNDDB occurrence (Occurrence #3, 2015) is located approximately 0.05 mile from the isolated staging areas. This species was not observed during the seasonally appropriate botanical surveys.

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 5.4-5. Special-Status Plant Species with Potential to Occur in the BSA

Scientific Name/ Common Name	Status[a]			Habitat	Blooming Period	Potential for Occurrence within the BSA
	Federal	State	CNPS			
Micropus amphiboles Mt. Diablo cottonweed	-	-	3.2	Broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland.	March to May	**Moderate.** Quality habitat exists in areas of thin soils and exposed rock outcrops in the BSA. The nearest herbarium collection is from a 1937 Nelson specimen from near Tunnel Road in Alameda County (Accession #UC1543173). However, this species was not observed during the seasonally appropriate botanical surveys.
Streptanthus albidus subsp. peramoenus most-beautiful jewelflower	-	-	1B.2	Valley and foothill grassland. Serpentine outcrops on ridges and slopes.	(March) April to September (October)	**High.** Quality habitat exists throughout the BSA. There are several CNDDB occurrences within 5 miles of the BSA; the closest (Occurrence #68, 2004) is located approximately 1 mile southeast of the project. In addition, there is one unprocessed occurrence in the CNDDB from 2019, located 0.15 mile north of the project footprint. However, this species was not observed during the seasonally appropriate botanical surveys.

Sources: CDFW 2021b; CNPS 2021; Lake 2021; USFWS 2021

[a] Status designations are as follows:

FT = federally threatened
SE = state endangered

California Rare Plant Rank codes:

1B Rare, Threatened, or Endangered in California and elsewhere

California Rare Plant Rank threat codes:

1B.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)

1B.2 Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)

4.2 Limited distribution and moderately threatened in California

Special-status Wildlife Species

The records search identified 31 special-status wildlife species within 5 miles of the project footprint. Suitable habitat for 12 of the 31 species was identified in the wildlife survey area. These 12 species were either observed during the wildlife assessment or determined to have a moderate or high potential to occur. Protocol-level surveys were not conducted for these species. These species are presented in Table 5.4-6 and described further in the following subsections. The remaining 21 species that were determined to be unlikely to occur (low potential) are discussed in Appendix B3.

Crotch's Bumble Bee

Crotch's bumble bee (*Bombus crotchii*) is a candidate for listing as endangered under the CESA. This invertebrate species occurs in grassland and scrub habitats with wildflower resources for foraging, nesting underground (Xerces 2018). Crotch's bumble bee is commonly found in relatively warm and dry regions, including the inner Coast Range of California and margins of the Mojave Desert.

Grassland habitat with floral resources throughout the BSA provides suitable habitat for Crotch's bumble bee. The project footprint is within the current range of the species (CDFW 2023d). Floral resources were documented during the 2021 botanical surveys. The SBI wildlife assessment was conducted in December, outside of the appropriate season for identifying floral resources. There is one CNDDB record within 5 miles of the BSA that includes an individual photographed in Berkeley in 2015 (Occurrence #308, CDFW 2023c). There are no current occurrence records for the BSA in the Xerces Bumble Bee Watch (Hatfield et al. 2020). This species is considered to have a moderate potential to occur.

Monarch Butterfly

The monarch butterfly (*Danaus plexippus plexippus*) is a candidate for listing as endangered by the USFWS (2020). On December 15, 2020, the USFWS announced that listing the monarch butterfly under the FESA is warranted but precluded by other priorities. Monarchs rely on milkweed for larval development while adults need nectar to fuel their migration. Each fall, last year's generation of adults migrates to overwintering sites, some in coastal California, that provide suitable microhabitat conditions, including protection from wind and freezing temperatures. Overwintering sites in coastal California include blue gum eucalyptus groves within mixed urban-farmland development.

There are two presumed extant CNDDB occurrences approximately 5 miles west of the BSA. One (Occurrence #415) is at Berkeley Aquatic Park, the second (Occurrence #322) is next to the Oakland International Airport. There are 11 known overwintering sites in Alameda County and two in Contra Costa County (Pelton et al. 2016). None of the known overwintering sites are within the BSA – the two nearest overwintering sites are at Albany Hill, which is 7 miles to the northwest and Monarch Bay Golf Course, which is 9 miles to the southwest. These and other Bay Area overwintering sites are located close to the Bay and coast, and none are found as far inland as the Berkeley/Oakland Hills at the project footprint (Xerces 2024). There is grassland habitat that could support milkweed and floral foraging and Moraga Substation could support native narrow leaf milkweed based on Calflora habitat prediction models for the species. No milkweed plants were observed during the botanical surveys conducted in 2021 (Nomad 2022). Eucalyptus trees were observed near the Shepherd Canyon LZ/SA and there is a grove near EBRPD McCosker staging area. The potential for occurrence for overwintering sites is low, as is the potential for breeding, although there is moderate potential for monarchs to pass through the area and use floral foraging resources.

Table 5.4-6. Special-Status Wildlife Species

Scientific Name/ Common Name	Status[a]			Habitat	Occurrence Assessment
	Federal	State	CDFW		
Invertebrates					
Bombus crotchii Crotch's bumble bee	--	SCE	--	Grassland and scrub habitats with wildflower foraging habitat; occurs at relatively warm and dry sites, including the inner Coast Range of California and margins of the Mojave Desert	**Moderate.** Suitable habitat is present within or adjacent to all work areas where grassland, scrub, and foraging habitat is present. The project footprint is within the current range of the species (CDFW 2023c). Floral resources were documented during Nomad Ecology's 2021 botanical surveys although SBI surveys were conducted outside of appropriate season. There is one CNDDB record within 5 miles of the project footprint that includes an individual photographed in Berkeley in 2015 (Occurrence #308). There are no current occurrence records within the BSA in the Xerces Bumble Bee Watch (Hatfield et al 2020).
Danaus plexippus plexippus Monarch butterfly	CE	--	--	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**Low (breeding, overwintering) to Moderate (foraging).** Potential suitable overwintering sites in eucalyptus trees are found within or adjacent to the project footprint, including a eucalyptus grove near the Shepherd Canyon staging area and in the McCosker sub-area. There are two CNDDB occurrences approximately 5 miles to the west that are associated with established overwintering sites. One (Occurrence #415) is at Berkeley Aquatic Park, the second (Occurrence #322) is next to the Oakland International Airport. No known overwintering sites occur inland in the Berkeley/Oakland Hills area that overlaps with the project footprint (Xerces 2024). Suitable grassland habitat may support nectar plants for foraging. No native host plants (native milkweed) were found during botanical surveys conducted by Nomad in 2021.

Table 5.4-6. Special-Status Wildlife Species

Scientific Name/ Common Name	Status[a]			Habitat	Occurrence Assessment
	Federal	State	CDFW		
Amphibians					
Rana boylii (Central Coast DPS) Foothill yellow-legged frog	FT	ST	SSC	Perennial and ephemeral streams and rivers with rocky substrates and open, sunny banks in forests, chaparral, and woodlands. Utilize adjacent moist terrestrial habitats for foraging and refugia.	**Low to Moderate.** Potential for occurrence in western portion of project footprint is low, eastern portion of the project footprint is moderate. There are three CNDDB records within 5 miles of the BSA. *Western portion – east of Manzanita Drive and McCosker Sub-area, Attachment B Map B-5 through B-9* (Appendix B3 - Wildlife Assessment Report) Potentially suitable habitat is present in portions of the project area east of Manzanita Drive and unnamed tributaries of San Leandro Creek west of Pinehurst Road. There are two extirpated occurrence records in this area (#4 and #5). The habitat is highly fragmented within the project footprint east of Manzanita Drive and the species has not been encountered in the McCosker sub-area by EBRPD during recent surveys (EBRPD 2018). Therefore, the potential for the species to be encountered within the portions of the project that occur east of Manzanita Drive and upper San Leandro Creek tributaries near McCosker sub-area west of Pinehurst Road is low. *Eastern portion – Wilder LZ/SA and Moraga Substation, Attachment B Map B-2 and B-3* (Appendix B3 - Wildlife Assessment Report) Potentially suitable habitat is also present in portions of the project footprint near Moraga Creek and unnamed tributary streams near Moraga Substation. The only extant record (Occurrence #6) is in Moraga Creek northwest of Moraga Substation. The potential for the species to be encountered in the portions of the project footprint in and near the Wilder LZ/SA and Moraga Substation is moderate.
Rana draytonii California red-legged frog	FT	--	SSC	Lowlands and foothills in or near permanent sources of water (ponds, creeks, marshes) with emergent or dense riparian vegetation. Riparian, upland habitat, and small mammal burrows important for movement and refugia.	**Moderate to High.** Suitable habitat is present within and adjacent to the work areas where stream habitat is present, which includes all eight drainages within the project footprint. BAHCP modeled breeding habitat is present throughout the project footprint east of Park Boulevard The nearest extant CNDDB record (Occurrence #226, 1997) is 0.5 mile northwest of the isolated staging areas. A historical but presumed extant record (Occurrence #8, 1931) is also located within 1 mile of the project footprint.

Table 5.4-6. Special-Status Wildlife Species

Scientific Name/ Common Name	Status[a]			Habitat	Occurrence Assessment
	Federal	State	CDFW		
Reptiles					
Actinemys marmorata Northwestern pond turtle	FC	--	SSC	Permanent and intermittent freshwater aquatic habitats including rivers, streams, lakes, ponds, marshes, and vernal pools. Prefers habitats with abundant basking sites, underwater refugia, and standing or slow-moving water. Nesting sites are on sandy banks and bars or in fields or sunny spots up to a few hundred meters from water.	**Low to Moderate**. Suitable aquatic habitat, breeding upland habitat, and winter refugia is present in urban creeks in the Sausal Creek Watershed. In the San Leandro Creek Watershed east of Manzanita Drive/Skyline Boulevard; tributary streams may provide suitable habitat if pools are present. There are four CNDDB records within 2 miles. The closest, an undated CNDDB occurrence (Occurrence #63), is from Lake Temescal approximately 1.8 miles northwest of the project footprint and is separated by dense urban development. A research grade iNaturalist record in 2022 from Montclair Park is located within 0.5 mile northwest of the project footprint near Shepherd Canyon Park.
Masticophis lateralis euryxanthus Alameda whipsnake	FT	ST	--	Chaparral; northern coastal sage scrub; coastal sage; and grassland communities.	**High to Present.** Suitable core and perimeter habitat is present within and adjacent to the project footprint. BAHCP modeled movement habitat is present within and adjacent to the project footprint at all work locations east of SR 13 CNDDB Occurrence #33 (1990) overlaps with the project footprint near the McCosker Creek Restoration Area. Two presumed extant CNDDB occurrences (#60, 2022; #95, 2006) are located within 500 feet and 2,500 feet of the project footprint.
Birds					
Accipiter cooperii. Cooper's hawk	--	--	WL	Associated with deciduous, mixed, and coniferous forest, and deciduous stands of riparian habitat in woodlands, riparian corridors, and along habitat edges, will nest in urban areas. They use mature trees with moderate to high crown-depths and canopy cover for nesting	**Moderate (foraging/nesting).** Suitable habitat is present within or adjacent to the project footprint including trees for nesting and urban areas, riparian corridors and oak woodland forest. There are two CNDDB records within 5 miles of the project footprint (Occurrence #84, 2003; Occurrence #115, 2006).
Aquila chrysaetos Golden eagle	--	--	FP	Open mountains, foothills, plains, open country. Requires open terrain. In the north and west, found over tundra, prairie, rangeland, or desert; very wide-ranging in winter, more restricted to areas with good nest sites in summer.	**High (foraging/nesting).** Suitable habitat is present within or adjacent to the project footprint including large trees for nesting and foraging habitat prevalent in all areas east of Manzanita Drive. There is one CNDDB record within 5 miles of the project footprint (Occurrence # 43, 1993). This occurrence corresponds with a known golden eagle nest site has been used consistently since 2005 in Sibley Volcanic Regional Preserve (EBRPD 2018).

Table 5.4-6. Special-Status Wildlife Species

Scientific Name/ Common Name	Status[a]			Habitat	Occurrence Assessment
	Federal	State	CDFW		
Mammals					
Antrozous pallidus Pallid bat	--	--	SSC	Low elevation arid or semi-arid open areas near water, rocky outcrops, and cliffs. Breeds and roosts in crevices in caves, mines, and cavities.	**Moderate**. Suitable roosting and foraging habitat is present within or adjacent to the project footprint wherever trees and structures are present to support roosting, especially along creeks in the Sausal Creek and San Leandro Creek watersheds. There are five CNDDB records within 5 miles of the project footprint.
Corynorhinus townsendii Townsend's big-eared bat	--	--	SSC	Mesic habitats, forages around trees and brush along habitat edges. Breeds and roosts in caves, mines, tunnels, cavities or buildings.	**Moderate**. Suitable roosting and foraging habitat is present within or adjacent to the project footprint wherever trees and structures are present to support roosting, especially along creeks in the Sausal Creek and San Leandro Creek watersheds. There is one historical CNDDB record (Occurrence #293, 1938) within 5 miles but is possibly extirpated.
Lasiurus blossevillii Western red bat	--	--	SSC	Prefers edges or habitat mosaics that have trees for roosting and open areas for foraging. Roost sites often are in edge habitats adjacent to streams, fields, or urban areas. Requires water.	**Moderate**. Suitable roosting and foraging habitat is present within or adjacent to the project footprint. There are no CNDDB records within 5 miles. The majority of the project work areas is within CDFW predicted habitat (CDFW 2021c).
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	--	--	SSC	Forest habitats of moderate canopy and moderate to dense understory. May prefer chaparral and redwood habitats. Constructs nests of shredded grass, leaves, and other material. May be limited by availability of nest-building materials.	**Present.** Suitable habitat is present within or adjacent to the project footprint. Nests were observed adjacent to the project footprint during the wildlife assessment and during a November 2023 site visit. There are 12 unprocessed CNDDB occurrences documenting individuals, active nests and observed nest structures in 2020 and 2021 at the McCosker Creek Restoration Area.

Sources: CDFW 2023c; USFWS 2023

[a] Status designations are as follows:

Federal status:

FT = Listed as threatened under Endangered Species Act
FC = Candidate for listing under Endangered Species Act

State Status:

ST = Listed as threatened under the California Endangered Species Act
SCE = Candidate for listing as endangered under the California Endangered Species Act

CDFW Status:

SSC = Species of Special Concern
FP = Fully Protected

WL = Watch List
AHCP = PG&E Bay Area O&M Habitat Conservation Plan
DPS = Distinct Population Segment

Foothill Yellow-legged Frog

Federal listing status of the foothill yellow-legged frog (*Rana boylii*) (FYLF) varies by Distinct Population Segment (DPS); the project is within the boundaries of the Central Coast DPS, where the frog is federally listed as threatened (USFWS 2023c). At the state level, the frog's listing varies by clade and the project is within the West/Central Coast clade. Frogs of this clade are state listed as endangered under the CESA (CFGC 2020). FYLF occurs in Pacific river systems from Oregon to Southern California. This species is found in streams with shallow, flowing water, with at least some cobble-sized substrate. Egg masses are deposited on the downstream side of cobbles and boulders where slow-flowing shallow water levels exist, generally deposited between late March and early June. Eggs need a minimum of 15 weeks to develop before metamorphosis, which typically occurs between July and September. Aquatic and terrestrial insects are thought to be prey items of the FYLF. Foothill yellow-legged frogs stay close to their aquatic habitat, typically within 10 feet and use riparian corridors for movement but have been documented using upland habitats with an average distance of 234 feet from water (CFGC 2020).

The BSA intersects multiple drainages that provide suitable habitat to support FYLF. However, this species has not been observed in recent decades. There are six CNDDB occurrences within 5 miles of the project footprint and three within 2 miles; of these, only one record is presumed extant (CDFW 2023c). The nearest extant record is from near the community of Wilder (Occurrence #6) in Moraga Creek, approximately 2,000 feet southeast of the Wilder LZ/SA and overlaps with the access road in the project footprint (Attachment B of the Wildlife Assessment Report [Appendix B3]). In 1997, two adults were observed in a plunge pool upstream of riparian habitat on private property. EBRPD biologists believe this observation may have been a misidentification (EBRPD 2018; CDFW 2019).

Suitable habitat is present in the BSA within Moraga Creek and unnamed tributaries near Moraga Substation within the upper portions of the San Leandro Creek Watershed. If a remnant population is present, the species could be using these creeks and adjacent moist uplands near Moraga Substation. Given the 1997 record is still considered extant despite controversy, there is a low to moderate potential for the species to occur in this area. No FYLFs were observed during the wildlife assessment.

California Red-Legged Frog

The California red-legged frog (CRLF) is listed as threatened under the FESA and is a CDFW SSC. Critical habitat was designated in 2010 (USFWS 2010). CRLF breeds in wetlands, lakes, ponds, and other still or slow-moving sources of water that remain inundated long enough for larvae to complete metamorphosis, which typically occurs from 11 to 20 weeks after hatching (Storer 1925). During summer months, CRLF forage and disperse in uplands and are known to take refuge in cool, moist areas, including rodent burrows and soil crevices near aquatic habitats. Adult CRLF tend to be most active at night during wet weather, but they may move through upland areas at any time during the year (USFWS 2002). CRLF may disperse over 2 miles from breeding ponds but movement distances of up to 1 mile are more common. Dispersal can be straight line distances between aquatic habitat as well as along creeks and drainages. Dispersal habitat includes upland or riparian zones within 1 mile of occupied locations, which allows movement between sites (USFWS 2008).

The project footprint intersects multiple drainages that are modeled as suitable breeding habitat by the BAHCP (Attachment B of the Wildlife Assessment Report [Appendix B3], PG&E 2017). Modeled suitable breeding habitat is characterized as the riparian area and the actual wetted areas of the stream, creek, or drainage. PG&E used a conservative estimate of 300 feet on each side of the stream to delineate suitable breeding habitat in the BAHCP.

There are eight presumed extant CNDDB occurrences within 5 miles of the project footprint; two records that are within 1 mile are presumed extant (CDFW 2023c). The nearest extant record is 0.5 mile northwest of the Wilder LZ/SA (Occurrence #226, 1997), occurring before the construction of the community of Wilder when two adults were observed in a culvert outlet pool below a siltation pond. A stormwater detention basin is now present nearby (0.5 mile north of project footprint), which may provide suitable breeding habitat in wet years. Occurrence #8 (1940s) from Thornhill Pond is mapped in the CNDDB at the present location of the Montclair Swim Club. Marc Jennings provided an assessment of this occurrence record and its location as part of a nearby project and believes it was located along the present SR 13 corridor and was demolished during construction of the highway (The Planning Center DC&E 2012). Although it is likely that this pond and population have been extirpated, suitable breeding and upland habitat continues to be present in nearby drainages. The species has moderate to high potential to occur in the BSA. No CRLF were observed during the wildlife assessment.

Northwestern Pond Turtle

Northwestern pond turtle (*Actinemys marmorata*) is a candidate for listing under the FESA and is a CDFW SSC. This species occurs from Monterey Bay to Oregon and Washington (USFWS 2023). Northwestern pond turtles are thoroughly aquatic, preferring the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 2003). The species occurs in a wide range of both permanent and intermittent aquatic environments (Jennings et al. 1992). Pond turtles are semi-aquatic, with terrestrial and aquatic life history phases: eggs are laid in upland terrestrial habitat and hatchings, juveniles and adults can use both terrestrial and aquatic habitats. Terrestrial environments are used for nesting, overwintering and aestivation (warm season dormancy) basking, and movement/dispersal. Aquatic environments are required for breeding, feeding, overwintering and sheltering, and movement/dispersal (USFWS 2023d). Northwestern pond turtles can move up to 1,300 feet or more to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Northwestern pond turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992).

Suitable habitat for Northwestern pond turtle includes California annual grassland, mixed riparian forest woodland, mixed willow riparian scrub, perennial freshwater marsh, pond, riverine stream, sycamore alluvial woodland, valley sink scrub, golf course/urban park, ruderal, and rural residential areas. In the winter, Northwestern pond turtles hibernate underwater in ponds or slow-moving pools or in adjacent woodlands by burying themselves in leaf litter, loose soils, or within burrows.

Although most of the project's work areas are on ridgelines, access roads and the access to staging areas at Wilder and McCosker are within dispersal distance of suitable ponds. The project footprint is adjacent to suitable aquatic habitat, breeding upland habitat, and winter refugia present in urban creeks in the Sausal Creek Watershed between Shepherd Canyon and Park Boulevard and in the San Leandro Creek Watershed east of Manzanita Drive and Skyline Boulevard in the BSA (Attachment B of the Wildlife Assessment Report [Appendix B3]). The potential for this species to occur in this portion of the project footprint west of Manzanita Drive and Skyline Boulevard is considered moderate.

In the BSA east of Manzanita Drive/Skyline Boulevard, pools within tributary streams may provide suitable habitat that could support foraging and basking; however, there are no CNDDB records within this portion of the BSA or in these streams. There are two human-made aquatic features outside of the BSA that could provide suitable aquatic habitat which turtles could occupy, including a stormwater basin 0.64 mile to the northwest of the Wilder LZ/SA with riparian connectivity to the project footprint and a pond on private property 0.4 mile southeast of the Fiddleneck LZ/SA. If turtles are occupying these resources, they could disperse into the project footprint. The potential for this species to occur in this portion of the project footprint is considered low.

No impacts are proposed directly within the creeks, and most of the project work is occurring on or near ridgelines away from aquatic habitat. However, portions of access roads and LZ/SAs surrounding uplands of mapped drainages could provide potential dispersal and breeding habitat for the species. The work areas near McCosker, Moraga Substation, and throughout the eastern edge of the project are within dispersal distance of creeks. The access road from Wilder LZ/SA to Moraga Substation is adjacent to a creek that is near access roads and the LZ/SA. No Northwestern pond turtles were observed during the wildlife assessment.

Alameda Whipsnake

AWS is listed as threatened under the FESA and the CESA. This species uses a wide variety of habitats, including grassland, oak savanna, and woodland habitats, but is most frequently found in or near chaparral and scrub habitats (Swaim 1994). In areas of open woodland and grassland where cover such as rock outcrops, fallen logs, or trees structurally similar to brush habitat is present, the use of these habitats likely increases. Small rodent burrows and rock crevices are commonly used by AWS as retreat sites in both grassland and scrub habitats, brush piles, soil crevices and debris piles were also occasionally used (Swaim 1994). AWS are most active between April and late June with a period of highly reduced activity in the winter (Swaim 1994; Alvarez et al. 2021). A secondary peak in activity in the fall has been detected for dispersing young of the year (Swaim 1994).

Much of the project is mapped as movement habitat for AWS in the BAHCP (Attachment B of the Wildlife Assessment Report [Appendix B3]) (PG&E 2017). Movement habitat is defined as grassland, oak savanna, and occasionally oak-bay woodland habitats greater than 500 feet from scrub. Scrub habitat is considered core habitat for AWS and all natural land cover types from 0 to 500 feet from scrub is perimeter core habitat.

The project crosses directly through USFWS-designated Critical Habitat Unit 6 for the species (Section 5.4.1.6 and Figure 5.4-6) and suitable habitat, including core and perimeter habitat and the HCP movement habitat, is found within and adjacent to the project footprint east of Manzanita Drive/Skyline Boulevard (Attachment B of the Wildlife Assessment Report [Appendix B3]). Potentially suitable habitat to the west becomes highly fragmented and is only found in small patches around homes; individuals could move into the area through Shepherd Canyon where BAHCP-mapped movement habitat and both core and perimeter core habitat is present. There are no known occurrences along the alignment west of SR 13.

Because suitable habitat is present and extant CNDDB occurrences have been mapped adjacent to the project footprint, there is a high potential for this species to occur. AWS is also considered to have a high potential to occur in areas of BAHCP-mapped habitat. This species was not observed during the wildlife assessment.

Cooper's Hawk

Cooper's hawk (*Accipiter cooperii*) is a CDFW WL Species. This species is associated with deciduous, mixed, and coniferous forests, and deciduous stands of riparian habitat in woodlands, riparian corridors, and along habitat edges (NatureServe 2024). They feed on birds and small mammals, hunting in a variety of habitats. Cooper's hawks use mature trees with moderate to high crown depths and canopy cover for nesting, and will nest in urban areas, feeding on birds and small mammals found at backyard feeders.

Suitable foraging and nesting habitat in woodlands is present within and adjacent to the project footprint. The PG&E structures within the project footprint provide suitable perching habitat. This species has a moderate potential to occur in the BSA.

Golden Eagle

Golden eagle is a CDFW Fully Protected Species and is protected under the BGEPA (Section 5.4.2.1.3). Alameda County supports a high density of nesting golden eagles (CNDDB 2023c). Habitat typically is rolling foothills, mountain areas, sage-juniper flats, or desert. Golden eagles breed from late January through August, constructing nests on cliffs, large trees, or electrical towers; they require open areas for foraging. There is a known nesting location in Sibley Preserve (EBRPD 2018). Grassland east of Manzanita Drive/Skyline Boulevard provides suitable foraging habitat. Woodlands in the area provide large trees and PG&E structures have structural components that could support nesting and suitable perching habitat. The species has high potential to occur in the BSA.

Pallid Bat

Pallid bat (*Antrozous pallidus*) is a CDFW SSC and is ranked as "high priority" by WBWG. Day-roosting habitat for this species typically includes rocky outcrops, cliffs, large-diameter live and snag trees, and spacious crevices near open foraging habitats. Pallid bats may also roost in caves, mines, bridges, barns, porches, bat boxes, stone piles, rags, baseboards, rocks, and on the ground. Day roosts are generally warm and out of reach from ground predators and may consist of single- or mixed-sex colonies in crevices or man-made structures. Pallid bats have also been documented using culvert structures and bridges for roosting. The number of individuals in a day roost range from a few individuals to a couple of hundred individuals. There are five CNDDB records within 5 miles of the BSA. All are presumed extant.

Suitable foraging and roosting habitat is present within and adjacent to project work areas wherever appropriate habitat features are present, especially along creeks in Sausal Creek and San Leandro Creek watersheds. This species was determined to have a moderate potential to occur with the BSA. No pallid bats were observed during the wildlife assessment.

Townsend's Big-eared Bat

Townsend's big-eared bat (*Corynorhinus townsendii*) is a CDFW SSC and is ranked as "high priority" by WBWG. This species is found throughout California, but the details of its distribution are not well known. Townsend's big-eared bats are found in all but subalpine and alpine habitats and may be found at any season throughout its range. The species requires cavity-type habitats such as caves, tree basal hollows, mines, tunnels, buildings, bridges, or other human-made structures for roosting. Townsend's big-eared bats may use separate sites for night, day, hibernation, or maternity roosts. Hibernation sites are generally cold, but not below freezing. Individuals may move within the hibernaculum to find suitable temperatures. Maternity roosts are found in generally warm sites. Day roosting colonies can range from a singly roosted male or female depending on season to groups of individuals into the hundreds during maternity season. There is one historical CNDDB record (Occurrence #293, 1938) of the Townsend's big-eared bat occurring within 5 miles of the BSA that is possibly extirpated.

Suitable foraging and roosting habitat is present within and adjacent to project work areas wherever appropriate habitat features are present, especially along creeks in Sausal Creek and San Leandro Creek watersheds. This species was determined to have a moderate potential to occur with the BSA.

Western Red Bat

Western red bat (*Lasiurus blossevillii*) is a CDFW SSC and is ranked as "high priority" by WBWG. This species can be found throughout California's lower elevations, with many records concentrated in the Central Valley. Like some bats found in California, Western red bats make regional seasonal movements between their winter and maternity roosts. As a foliage roosting bat, the Western red bat is closely associated with well-developed riparian habitats but will also use other habitats (orchard trees, eucalyptus, tamarisk) that provide suitable dense clusters of leaves creating suitable roosting sites. Of note, this species has been observed roosting on the ground within leaf clutter. The Western red bat is a solitary roosting bat that will often have two pups per year. There are no CNDDB records within 5 miles of the BSA. The entire project footprint is mapped by CDFW as potential habitat (CDFW 2021c).

Suitable foraging and roosting habitat is present within and adjacent to project work areas wherever appropriate habitat features are present. CDFW considers the entire project footprint as potential habitat. This species was determined to have a moderate potential to occur with the BSA.

San Francisco Dusky-footed Woodrat

San Francisco dusky-footed woodrat subspecies (*Neotoma fuscipes annectens*) is a CDFW SSC. This species is found in mixed coniferous forests, oak and riparian woodlands and chaparral habitats (Carraway and Verts 1991). It is most abundant in areas with dense shrub cover and has been shown to be strongly associated with densely vegetated, structurally complex habitats. The species constructs nests (middens) out of sticks and other debris. Nests are constructed on the ground, in rocky outcrops, or in trees and are often found in concentrations along riparian corridors. They may be reused by successive generations and some can grow to be 6 feet or more in height, while others are well hidden and easily overlooked.

One San Francisco dusky-footed woodrat nest was observed within the project footprint during the wildlife assessment within 0.25 mile west of Moraga Substation (Attachment B of the Wildlife Assessment Report [Appendix B3]). Five nests were observed in November 2023 by PG&E biologists in the same vicinity. Additionally, there are 12 unprocessed CNDDB occurrences documenting individuals, active nests, and middens in 2020 and 2021 at the McCosker Ranch (CDFW 2023c). Suitable habitat is present throughout much of the project footprint, and the species is present.

Other Migratory Birds and Nesting Raptors

Suitable nesting habitat is present in the grassland, woodland, and shrub habitat as well as electrical structures and urban habitat throughout the BSA. All native bird species are protected by the federal Migratory Bird Treaty Act (MBTA) and the CFGC, which prohibit take of individuals (including active nests) (Sections 5.4.3.1.2 and 5.4.3.2.4).

5.4.1.6 Critical Habitat

A total of 1,231 acres of the BSA is located within USFWS-designated AWS Critical Habitat Unit 6 – Caldecott Tunnel (Figure 5.4-5b, Figure 5.4-6 and Figure 3 of Wildlife Assessment Report [Appendix B3]). Specifically, the BSA overlaps critical habitat between Moraga Substation and Manzanita Drive/Skyline Boulevard. On October 2, 2006, the USFWS issued a final rule designating critical habitat for the Alameda whipsnake; the rule became effective on November 1, 2006 (USFWS 2006). In total, approximately 154,834 acres of critical habitat were designated for the taxon in Alameda, Contra Costa, Santa Clara, and San Joaquin Counties, California. Unit 6 is 4,151 acres in size. Impacts are shown on Figures 5.4-7 and 5.4-8 and addressed in Section 5.4.4.

The nearest critical habitat unit for the CRLF (CCS-1) is located approximately 4.5 miles north of the BSA. No critical habitat has been designated for the FYLF.

5.4.1.7 Native Wildlife Corridors and Nursery Sites

Aquatic habitats in the vicinity of the project footprint could potentially provide migratory pathways for aquatic species, including CRLF, FYLF, and Northwestern pond turtle (Section 5.4.1.5.2). Upland habitats provide dispersal habitat for CRLF and AWS. The project footprint overlaps BAHCP modeled habitats for both species (Attachment B of the Wildlife Assessment Report [Appendix B3] and Figure 5.4-6). Migratory birds may move through the BSA during work activities and may nest in the vicinity. There are no known spawning areas for native fish, fawning areas for deer, maternal roosts for bats, or known bird nesting rookeries within the BSA.

The eastern portion of the project (Eastport Canyon; east of Manzanita Drive) has been mapped as an "irreplaceable and essential corridor" in CDFW's Terrestrial Connectivity Areas of Conservation Emphasis dataset (CDFW 2017) and shown on Figure 5.4-10.

The California Essential Habitat Connectivity Project (CEHC) maps a statewide network of relatively intact Natural Landscape Blocks connected by Essential Connectivity Areas (Spencer et al. 2010) focusing attention on large areas important to maintaining ecological integrity at the broadest scale. The middle of Eastport Canyon has been mapped as a natural landscape block (defined as an existing natural open space having relatively high ecological integrity). The surrounding area, which overlaps the entire eastern portion of the project footprint, is part of the Mt. Allison-Briones Hills Essential Connectivity Area (CDFW 2024). The east side of the Canyon was mapped as the East Bay Hills-Diablo Range critical linkage (CDFW 2024). Small natural areas (small landscape blocks) have been mapped along Shepard Canyon Road; some work areas within the central portion of the project alignment overlap these areas. The eastern portion of the project area was also identified as part of the Science and Collaboration for

Connected Wildlands and Bay Area Open Space Council as an important open space and wildlife corridor (Penrod et al. 2013).

5.4.1.8 Biological Resource Management Areas

Biological resource management areas were identified within and surrounding the project and within a 5-mile buffer. These areas are discussed in the following subsections.

PG&E Bay Area Operations and Maintenance Habitat Conservation Plan

The PG&E BAHCP provides an efficient and consistent approach to both FESA compliance and long-term species conservation. In 2017, PG&E began implementation of the BAHCP, which covers the Bay Area region of its service area and includes Sonoma, Marin, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco counties.

The 30-year Section 10(a)(1)(B) permit issued by USFWS authorizes take of 18[17] wildlife and 13 plant species during routine day-to-day O&M activities as well as large maintenance improvement projects such as this one that require extensive planning and coordination. Modeled habitat for several of the covered species was mapped as part of the conservation planning process to determine where potential impacts occur and their extent. The BAHCP then addresses impacts to these species that may result from covered O&M activities and details the measures to avoid, minimize, and mitigate said impacts (PG&E 2017). The BAHCP is available at https://ecos.fws.gov/docs/plan_documents/thcp/thcp_2897.pdf. The project is considered a PG&E O&M activity and is covered under the BAHCP. The project includes less than 2 miles in natural or agricultural areas and falls within a combination of covered activities, including E9, Line Reconductoring; E12, New Distribution and Transmission Line Construction or Relocation; and E 13, Tower Line Construction. E9, Line Reconductoring, covers reconductoring activities, including use of pull sites and work areas as well as temporary clearance structures at road or utility crossings. Activities E12 and E13 cover installation or replacement of poles or towers with associated staging areas and laydown areas and, if needed, new unsurfaced access road or repair or replacements of degraded access roads.

All covered activities require implementation of field protocols, which are general measures designed to avoid or minimize potential impacts on biological resources and covered species. Work in "hot zones" requires implementation of hot zone avoidance and minimization measures (AMMs). A hot zone in the HCP is a defined area containing an extant population of covered wildlife species with a small and well-defined range where the species would occur and may be affected by covered activities. Hot zone AMMs ensure impacts on these narrow endemic species are avoided or minimized; each measure focuses on a particular species or suite of species and is to be applied when PG&E undertakes covered activities within the corresponding hot zone. PG&E also developed Map Book zones (MBZs) for covered plant species. These MBZs are areas with extant, known, or recently confirmed plant occurrences, as determined by a series of one-time botanical surveys, that warrant implementation of unique covered plant AMMs. Additional species-specific AMMs, designed to minimize impacts to specific covered wildlife species, are to be implemented as applicable.

PG&E also has obtained an ITP under Section 2081 of the CESA with the CDFW. The ITP covers PG&E's San Francisco Bay Area O&M and minor new construction activities for its natural gas and electric lines, and establishes a comprehensive approach to avoid, minimize, and fully mitigate impacts on covered species and habitat (collectively "covered activities"). The ITP provides incidental take coverage for three species: AWS, California tiger salamander (*Ambystoma californiense*) (CTS), and California freshwater shrimp (*Syncaris pacifica*). The geographic scope of the ITP encompasses the project BSA. Measures relevant to AWS are included in the following text. In addition to the ITP, an FEIR was submitted in support of PG&E's application for the ITP (CDFW 2022a). The ITP FEIR presented APMs designed to minimize impacts to state-listed and other special-status species. The ITP issued in 2022 includes APMs

[17] The BAHCP covers two Distinct Population Segments (DPS) of California tiger salamander (Central California DPS and Sonoma County DPS). However, California tiger salamander is one species (*Ambystoma californiense*).

and conditions of approval, collectively referred to in this section as ITP measures or ITP APMs, to minimize impacts to state listed and other special-status species (CDFW 2022b).

Two BAHCP covered wildlife species, AWS and CRLF, have the potential to occur within the project footprint (Section 5.4.1.5.2). The project does not overlap any BAHCP hot zones but does overlap pallid manzanita MBZs. This BAHCP covered plant species was observed during the 2021 botanical surveys. As an O&M activity, the project also is covered under the ITP, which authorizes take of AWS.

The project will implement the measures from the BAHCP and the ITP as well as the ITP FEIR APMs. Construction practices and the project-specific APMs are designed to be compatible with the BAHCP measures, which have been reviewed and approved previously by USFWS, and also are compatible with the ITP approved by CDFW and the FEIR measures issued by CDFW.

Based on the project design, biological resources, BAHCP and ITP measures, ITP FEIR APMs, and project-specific APMs, the project will minimize effects on special-status species, including those covered under the BAHCP and the ITP.

Other Biological Resource Management Areas

Other resource management areas in the BSA are EBRPD's Sibley Volcanic Regional Preserve and the Huckleberry Botanical Regional Preserve. The project's two isolated staging areas are located within the Sibley Preserve. Work areas in the central portion of the project area along Manzanita Drive overlap the boundary of the Huckleberry Botanical Regional Preserve.

Several additional biological resource management areas are located within 5 miles of the BSA (Figure 5.4-1). The EBMUD Low Effect East Bay HCP plan area is located north, south, and east of the project. This HCP preserves EBMUD-owned watershed lands and covers existing and prospective O&M activities that may result in incidental take of seven federally listed species. The California Department of Parks and Recreation Emeryville Crescent State Marine Reserve is located approximately 3.8 miles west of the project. The EBRPD Los Trampas Regional Preserve is located approximately 5 miles to the southeast of the project. The Mulholland Ridge Open Space Preserve is located approximately 1 mile northeast of the project along the boundary of the City of Orinda and the Town of Moraga.

Four open-space areas within 5 miles of the project area are managed by the John Muir Land Trust: Carr Ranch, Harvey Ranch, Painted Rock, and Bodfish Preserve. Carr Ranch is permanently protected as a CE. The Western Hills Open Space Area Conservation Easement held by the Wildlife Heritage Foundation is located directly adjacent to the Sibley Volcanic Regional Preserve and 0.25 mile east of the project's two isolated staging areas. The project alignment overlaps the Moraga Creek Open Space Area and Indian Valley Preserve Area Conservation Easement, also held by Wildlife Heritage Foundation, near Moraga Substation. Refer to Figure 5.11-2. PG&E has three easements, allowing for access and maintenance of the alignment within this CE. EBRPD also holds two small CEs, located along the western edge of the project area, bordering the residential neighborhood of Sibley Volcanic and Huckleberry Regional Preserves. A project staging area on Manzanita Drive is directly adjacent to the Huckleberry Regional Preserve Conservation Easement.

5.4.2 Regulatory Setting

5.4.2.1 Federal

Endangered Species Act

The FESA (16 United States Code [USC] 1531–1544), as amended, protects plants, fish, and wildlife that are listed as endangered or threatened by the USFWS or the National Marine Fisheries Service (NMFS). Section 9 of the FESA prohibits the "take" of listed fish and wildlife, where "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute prohibits removing, possessing, maliciously damaging, or destroying any listed plant under federal jurisdiction and removing, cutting, digging up, damaging, or destroying any listed plant in knowing violation of state law (16 USC 1538).

The FESA allows for issuance of incidental take permits to private parties either in conjunction with an HCP or as part of a Section 7 consultation (which is discussed in the following paragraph). Under Section 10 of the FESA, a private party may obtain incidental take coverage by preparing an HCP to cover target species within the project footprint, identifying impacts to the covered species, and presenting the measures that will be undertaken to avoid, minimize, and mitigate these impacts. As described in Section 5.4.1.8.1, PG&E obtained an HCP for its overall Operations and Management Program that is applicable to a number of species on this project.

Under Section 7 of the FESA, federal agencies are required to consult with USFWS and NMFS, as applicable, if their actions—including permit approvals or funding—may affect a federally listed species (including plants) or designated critical habitat. If the project is likely to adversely affect a species, the federal agency will initiate formal consultation with the USFWS or NMFS, which will issue a Biological Opinion as to whether the proposed agency action is likely to jeopardize the continued existence of a listed species (jeopardy) or adversely modify critical habitat (adverse modification). As part of the Biological Opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity, provided that the action will not jeopardize the continued existence of the species or adversely modify designated critical habitat.

Migratory Bird Treaty Act

The MBTA of 1918 (16 USC 703–711) protects all migratory birds, including active nests and eggs. Birds protected under the MBTA include all native waterfowl, shorebirds, hawks, eagles, owls, doves, and other common birds such as ravens, crows, sparrows, finches, swallows, and others, including their body parts (for example, feathers and plumes), active nests, and eggs. A complete list of protected species can be found in 50 CFR 10.13. Enforcement of the provisions of the federal MBTA is the responsibility of USFWS.

Bald and Golden Eagle Protection Act

The BGEPA (16 USC 668) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" Bald Eagles, including their parts, nests, or eggs. The Act provides criminal and civil penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any Bald Eagle... [or any Golden Eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb" is defined as "agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an Eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Waters and Wetlands: Clean Water Act Sections 401 and 404

The purpose of the Clean Water Act (CWA) (33 USC 1251 et seq.) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Waters of the United States include 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 CFR 328.3).

The USACE issues permits for work in wetlands and other waters of the United States based on guidelines established under Section 404 of the CWA. This regulation prohibits the discharge of dredged or fill material into waters of the United States, including wetlands, without a permit from the USACE. The U.S. Environmental Protection Agency also has authority over wetlands and may, under Section 404(c), veto a USACE permit.

Section 401 of the CWA requires all Section 404 permit actions to obtain a Water Quality Certification or waiver.

5.4.2.2 State

California Endangered Species Act

Sections 2050–2098 of the CFGC prohibit the take of state-listed endangered and threatened species unless specifically authorized by the 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. CDFW administers CFGC and authorizes take through permits or memorandums of understanding issued under Section 2081 of CFGC, or through a consistency determination issued under Section 2080.1. Section 2090 of CFGC requires state agencies to comply with threatened and endangered species protection and recovery and to promote conservation of these species.

Protection for Lakes and Streams

CDFW requires a Lake or Streambed Alteration Notification, pursuant to CFGC Section 1600 et seq., for project activities affecting bed, bank, or channel of lakes or streams and associated riparian habitat. Notification is required for any activity that may substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank, including associated riparian or wetland resources; or deposit or dispose of material where it may pass into a river, lake, or stream.

Fully Protected Species

CFGC designates certain fish and wildlife species as "fully protected" under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish). Fully protected species may not be taken or possessed at any time, and no permits may be issued for the project for incidental take of these species.[18]

Protection for Birds

CFGC Section 3503 et seq. state 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 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders of Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such birds.

Native Plant Protection Act of 1973

The Native Plant Protection Act of 1973 (CFGC Sections 1900 to 1913) includes provisions that prohibit the taking of endangered or rare native plants. CDFW administers the Native Plant Protection Act and generally regards as rare many plants listed with a CRPR 1A, 1B, 2A, and 2B of the CNPS Inventory of Rare, Threatened, and Endangered Plants of California. In addition, sometimes CRPR 3 and 4 plants are considered if the population has local significance in the area and is impacted by the project.

Section 1913(b) includes a specific provision to allow for the incidental removal of endangered or rare plant species, if not otherwise salvaged by CDFW, within a ROW to allow a public utility to fulfill its obligation to provide service to the public.

California Species of Special Concern

"Species of Special Concern" is a category conferred by CDFW to fish and wildlife species that meet the state definition of threatened or endangered, but have not been formally listed (for example, federally

[18] While take of fully protected species may be authorized by CDFW under a Natural Community Conservation Plan (NCCP), the PG&E project is not covered by an NCCP, so this permitting option is not available.

or state-listed species), or are considered at risk of qualifying for threatened or endangered status in the future based on known threats. SSC is an administrative classification only, but these species should be considered "special status" for the purposes of the CEQA analysis (refer to Section 5.4.1.1 of this document).

Porter-Cologne Water Quality Control Act

The State Water Resources Control Board (SWRCB) and the nine RWQCBs have jurisdiction over all surface water and groundwater in California, including wetlands, headwaters, and riparian areas. The SWRCB or applicable RWQCB must issue waste discharge requirements for any activity that discharges waste that could affect the quality of waters of the state, as described in more detail in Section 5.10, Hydrology and Water Quality.

5.4.2.3 Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process. This section includes a summary of local or regional plans, policies, or regulations that identify sensitive or special-status species in the project footprint, as well as local policies or ordinances that protect biological resources.

City of Orinda General Plan

The state-mandated Conservation Element can be found in Chapter 4, Environmental Resources, of the City of Orinda General Plan, which establishes policies for the conservation of natural resources in Orinda. Topics addressed include historical and archaeological resources; wildlife and wildlife habitats; creeks and drainages; water quality; flood hazards and control; mineral resources; and air quality. The General Plan supports the protection, preservation, restoration, and enhancement of habitats of state or federally listed rare, threatened, endangered, and other sensitive and special-status species, and promotes maintenance of open space and practices that conserve natural resources (City of Orinda 1987).

Tree Management

Chapter 17.21 of the City of Orinda Ordinance Code outlines management of trees on public and private property. A permit, which is not applicable to this project, is required to remove trees designated as protected. Protected trees include certain oak species (*Quercus* spp.), native riparian trees, or trees on vacant/undeveloped assessor's parcel that meet the size requirements presented in Section 17.21.2.

Heritage Trees

Per Chapter 17.24 of the City of Orinda Ordinance Code, a heritage tree is designated by the city council as such because of the tree's association with some person or event of historical significance or because of size (exceeds 15 inches in diameter), condition, or aesthetic qualities. A permit, which is not applicable to this project, is required to trim/prune or remove a designated heritage tree. However, if pruning is necessary either to prevent interference with or to maintain a public utility facility, no permit is required but pruning must conform to accepted arboricultural procedures.

Watercourse Maintenance, Alteration, and Protection

Chapter 18.03 of the City of Orinda Ordinance Code provides for the implementation of water quality, drainage, environmental, and riparian vegetation provisions of the Orinda General Plan and state and federal law. The ordinance includes requirements for the protection of native riparian vegetation and riparian wildlife habitats. A permit must be obtained from the planning director prior to impacting a watercourse, such as dredging or removal/alteration of vegetation at or near the watercourse. The city may impose conditions of approval in approving the permit, including riparian habitat restoration under Chapter 18.04 of the ordinance code. However, a permit is not required for this project.

Contra Costa County Ordinance Code

Heritage Trees

Chapter 816-4 of the Contra Costa County Ordinance Code regulates the removal of heritage trees and mandates adequate protection of heritage trees during construction. A heritage tree is defined as:

- A tree 72 inches or more in circumference measured 4.5 feet above the natural grade; or
- Any tree or group of trees particularly worthy of protection, and specifically designated as a heritage tree by the board of supervisors pursuant to the provisions of this chapter, because of:
  - Having historical or ecological interest or significance
  - Being dependent upon each other for health or survival
  - Being considered an outstanding specimen of its species as to such factors as location, size, age, rarity, shape, or health

Designated heritage trees may not be removed with a permit, which is not required for this project. Additionally, a permit is not required for trimming, pruning, or maintenance of a heritage tree as long as it does not result in destruction nor substantially change the tree's form or shape. Encroachment into the dripline of a heritage tree (or radius of 12 feet from the trunk) during construction or excavation must incorporate measures as deemed necessary by the building inspection department to minimize damage. Permission is required prior to backfilling.

Tree Protection and Preservation

Chapter 816-6 of the Contra Costa Ordinance Code provides for the preservation of certain protected trees in unincorporated areas of the county. Protected trees include those found in a riparian, foothill woodland, or oak savannah area or as otherwise defined in 816-6.6004. A permit is required to trim or remove a protected tree or encroach upon the tree dripline. However, trimming and clearing within public agency or utility easements and ROWs for maintenance of the easement or ROW will not require a tree permit.

City of Oakland General Plan

The Open Space Conservation and Recreation Element of the City of Oakland General Plan establishes policies for the conservation of natural resources in Oakland. Topics addressed include soil resources and land stability; mineral resources; plant and animal resources; hydrology and water quality; energy, and air quality. The General Plan supports the protection, preservation, restoration, and enhancement of habitats of state or federally listed rare, threatened, endangered, and other sensitive and special-status species, and outlines the policies for conservation and use of the city's natural resources (City of Oakland 1996).

City of Piedmont General Plan

The Natural Resources and Sustainability Element of the City of Piedmont General Plan establishes policies for the protection and management of earth, water, air, and biological resources in the City of Piedmont. It provides policies and actions on issues such as creek protection, hillside grading, air and water quality, and management of the city's "urban forest." The General Plan supports the protection, preservation, restoration, and enhancement of habitats of state or federally listed rare, threatened, endangered, and other sensitive and special-status species, and favors sustainable development within central locations (City of Piedmont 2009).

5.4.2.4 Habitat Conservation Plan

The BAHCP addresses impacts from day-to-day O&M activities as well as large maintenance improvement projects that require extensive planning and coordination and assumes that any activity could be implemented in a given year. As discussed in Section 5.4.1.8.1, the project includes less than 2 miles in natural or agricultural areas and, therefore, falls within covered activities E9, Reconductoring, and E13, Tower Line Construction, which also cover replacement.

PG&E Bay Area Operations and Maintenance Habitat Conservation Plan

The BSA falls entirely within the coverage area for the BAHCP, as discussed previously in Section 5.4.1.8.1. The BAHCP authorizes incidental take of 31 federally listed species during routine day-to-day O&M activities and large maintenance improvement projects in the Bay Area region of the PG&E service area. The BAHCP covered species with potential to occur in the project footprint include AWS, CRLF, and pallid manzanita. PG&E was also issued an ITP from CDFW authorizing take of three state-listed species during O&M activities. A detailed discussion of the BAHCP and ITP is provided in Section 5.4.1.8.1.

The project is considered a covered PG&E O&M activity and is covered under the BAHCP and the ITP. The BAHCP is available online at https://ecos.fws.gov/docs/plan_documents/thcp/thcp_2897.pdf.

5.4.3 Impact Questions

5.4.3.1 CEQA Impact Questions

The project's potential effects on biological resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.4-7 and discussed in more detail in Section 5.4.4.

Table 5.4-7. 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 Wildlife or the 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, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including marsh, vernal pool, coastal, and others) 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?	☐	☐	☒	☐

Table 5.4-7. CEQA Checklist for Biological Resources

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
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?	☐	☐	☐	☒

5.4.3.2 Additional CEQA Impact Question

The project's potential effects on biological resources also were evaluated using the CPUC's Additional CEQA Impact Questions for Biological Resources in the *Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments* (CPUC 2019). These additional impact questions are evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.4-8 and discussed in more detail in Section 5.4.4.

Table 5.4-8. Additional CEQA Impact Questions for Biological Resources

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Create a substantial collision or electrocution risk for birds or bats?	☐	☐	☒	☐

5.4.4 Potential Impact Analysis

The following sections describe significance criteria for impacts related to biological resources derived from Appendix G of the CEQA Guidelines, provide APMs, and assess potential project-related construction impacts on biological resources.

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

5.4.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "… a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project-related impacts on biological resources were evaluated for each of the criteria listed in Tables 5.4-7 and 5.4-8, as discussed in Section 5.4.4.4.

5.4.4.2 Applicant-Proposed Measures

PG&E will implement relevant measures from the BAHCP and ITP for covered species CRLF (BAHCP) and AWS (BAHCP and ITP), relevant general measures from the BAHCP and the ITP, relevant APMs from the ITP FEIR concerning other special-status and non-covered species, and proposed project APMs. These measures and APMs are presented in Tables 5.4-9 through 5.4-12. All the measures listed in these tables are incorporated as APMs for the proposed project. The numbering of the measures as presented in the BAHCP, ITP, and ITP FEIR has been retained for ease of reference. Refer to Appendix B6 for species-specific buffers for nesting birds (ITP FEIR APM BIO-2) (Table 5.4-12).

Table 5.4-9. Relevant Field Protocols from the BAHCP

Measure No.	Text
FP-01	Hold annual training on habitat conservation plan requirements for employees and contractors performing covered activities in the HCP Plan Area that are applicable to their job duties and work.
FP-02	Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
FP-03	Park vehicles and equipment on pavement, existing roads, or other disturbed or designated areas (barren, gravel, compacted dirt).
FP-04	Locate off-road access routes and work sites to minimize impacts on plants, shrubs, and trees, small mammal burrows, and unique natural features (e.g., rock outcrops).
FP-05	Notify a conservation landowner at least 2 business days prior to conducting covered activities on protected lands (state and federally owned wildlife areas, ecological reserves, or conservation areas); more notice will be provided if possible or if required by other permits. If the work is an emergency, as defined in PG&E's Utility Procedure ENV-8003P-01, PG&E will notify the conservation landowner within 48 hours after initiating emergency work. While this notification is intended only to inform the conservation landowner, PG&E will attempt to work with the conservation landowner to address landowner concerns.
FP-06	Minimize potential for covered species to seek refuge or shelter in pipes and culverts. Inspect pipes and culverts of diameter wide enough to be entered by a covered species that could inhabit the area where pipes are stored for wildlife species prior to moving pipes and culverts. Immediately contact a biologist if a covered species is suspected or discovered.
FP-07	Vehicle speeds on unpaved roads will not exceed 15 miles per hour [mph].
FP-08	Prohibit trash dumping, firearms, open fires (such as barbecues), hunting, and pets (except for safety in remote locations) at work sites.
FP-09	During fire season in designated State Responsibility Areas, equip all motorized equipment with federally approved or state-approved spark arrestors. Use a backpack pump filled with water and a shovel and fire-resistant mats and/or windscreens when welding. During fire "red flag" conditions, as determined by the California Department of Forestry and Fire Protection, curtail welding. Each fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C. Clear parking and storage areas of all flammable materials.
FP-10	Minimize the activity footprint and minimize the amount of time spent at a work location to reduce the potential for take of species.
FP-11	Utilize standard erosion and sediment control BMPs (pursuant to the most current version of PG&E's *Stormwater Field Manual for Construction Best Management Practices*) to prevent construction site runoff into waterways.
FP-12	Stockpile soil within established work area boundaries and locate stockpiles so as not to enter water bodies, stormwater inlets, other standing bodies of water. Cover stockpiled soil prior to precipitation events.
FP-13	Fit open trenches or steep-walled holes with escape ramps of plywood boards or sloped earthen ramps at each end if left open overnight. Field crews will search open trenches or steep-walled holes every morning prior to initiating daily activities to ensure wildlife are not trapped. If any wildlife are found, a biologist will be notified and will relocate the species to adjacent habitat or the species will be allowed to naturally disperse, as determined by a biologist.
FP-14	If the covered activity disturbs 0.1 acre or more of habitat for a covered species in grasslands, the field crew will revegetate the area with a commercial weed-free seed mix.
FP-15	Prohibit vehicular and equipment refueling 250 feet from the edge of vernal pools and 100 feet from the edge of other wetlands, streams, or waterways. If refueling must be conducted closer to wetlands,

Table 5.4-9. Relevant Field Protocols from the BAHCP

Measure No.	Text
	construct a secondary containment area subject to review by an environmental field specialist and/or biologist. Maintain spill prevention and cleanup equipment in refueling areas.
FP-16	Maintain a buffer of 250 feet from the edge of vernal pools and 50 feet from the edge of wetlands, ponds, or riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the land planner, biologist, or HCP administrator to minimize impacts by flagging access, requiring foot access, restricting work until dry season, or requiring a biological monitor during the activity.
FP-17	Directionally fell trees away from an exclusion zone[19] if an exclusion zone has been defined. If this is not possible, remove the tree in sections. Avoid damage to adjacent trees to the extent possible. Avoid removal of snags and conifers with basal hollows, crown deformities, and/or limbs over 6 inches in diameter.
FP-18	Nests with eggs and/or chicks will be avoided. Contact a biologist, land planner, or the Avian Protection Program manager for further guidance.

Table 5.4-10. Relevant Species-specific Avoidance and Minimization Measures from the BAHCP

Measure No.	Text
AMM Wetland-2	Identify wetlands, ponds, and riparian areas and establish buffers. Maintain a buffer of 50 feet around wetlands, ponds, and riparian areas. If maintaining the buffer is not possible because the areas are either in or adjacent to facilities, the field crew will implement other measures as prescribed by the biologist or HCP administrator to minimize impacts. These measures include flagging access, requiring foot access, restricting work until the dry season, requiring a biological monitor during the activity, or excavating burrows in ROWs where trenching will occur. Activities must maintain the downstream hydrology to the wetland, pond, or riparian area. Additional minimization measures may be implemented with prior concurrence from USFWS.
AMM Plant-01	No herbicides will be used for vegetation management, pole clearing, or any other purpose within 100 feet of an MBZ (except vegetation management's direct application to cut stumps when greater than 25 feet from an MBZ and in conformance with applicable pesticide regulations).
AMM Plant-02	Heavy equipment shall remain on access roads or other previously disturbed areas unless otherwise prescribed by a land planner, biologist, or HCP administrator.
AMM Plant-03[20]	Stockpile separately the upper 4 inches of topsoil during excavations associated with covered activities. Stockpiles topsoil will be used to restore the disturbed ROW.
AMM Plant-04	When covered activities greater than 0.1 acre in size within a MBZ will have direct impacts on covered species, work with the crew to place flagging, fencing, or other physical exclusion barriers to minimize disturbances. If the work will directly impact covered plant species, implement AMMs Plant-05, -06, -07, and -08.
AMM Plant-05	If a covered plant species is present and it cannot be avoided, PG&E will salvage plant material (i.e., seeds, cuttings, whole plants) and prepare a restoration plan that details the handling, storage, propagation, or reintroduction to suitable and appropriate habitat subject to USFWS review and approval.
AMM Plant-06	If a covered annual plant species is present and it cannot be avoided, conduct covered activities after seeds have matured to the extent possible
AMM Plant-07	If a covered perennial plant species is present and it cannot be avoided, conduct covered activities after seeds have matured to the extent possible. Minimize disturbance to the below-ground portions of the plants (e.g., roots, bulbs, tubers).

[19] Per the BAHCP, an exclusion zone is an area marked with fencing, signage, stakes, or flagging. Exclusion zones are "do not enter" areas, except as instructed by a biologist or the BAHCP Administrator. The exclusion zone distance is a guideline that may be modified by the biologist, based on site-specific conditions (including, but not limited to, habituation by the species or background disturbance levels) (refer also to ITP FEIR APM BIO-7, Table 5.4-12).

[20] BAHCP AMM Plant-03 applies specifically to annual plant species: Sonoma sunshine, Marin dwarf-flax, Burke's goldfields, Contra Costa goldfields, Sebastopol meadowfoam, white-rayed pentachaeta, and Metcalf Canyon jewelflower. None of these BAHCP covered annual species were observed during the 2021 botanical surveys.

Table 5.4-10. Relevant Species-specific Avoidance and Minimization Measures from the BAHCP

Measure No.	Text
AMM Plant-08	PG&E will prune shrubs in a manner that promotes resprouting. If permanent impacts are unavoidable, establish new individuals by planting seedlings or from cuttings in adjacent suitable habitat. PG&E will implement BMPs, including vehicle, equipment, and personnel hygiene protocols; procedures for conducting activities in infected areas; and timing restrictions that avoid working when soils are moist and the likelihood of spreading *Phytophthora cinnamomi* is greatest.

Table 5.4-11. Relevant CDFW Measures from the Bay Area O&M ITP

Measure No.	Text
General Provisions	
5.3	Biological Monitor Authority. To ensure compliance with the Conditions of Approval of this ITP, all Designated Biologists and General Biological Monitors shall immediately stop any activity, when safe to do so, that does not comply with this ITP and/or order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species. PG&E shall provide unfettered access to each Work Area and otherwise facilitate the Designated Biologists and General Biological Monitors in the performance of his/her duties. If a Designated Biologist or General Biological Monitor are either unable to comply with the ITP or prevented from performing required ITP compliance, then they shall notify the CDFW Representative immediately. PG&E shall not enter into any agreement or contract of any kind, including but not limited to non-disclosure agreements and confidentiality agreements, with its contractors and/or Designated Biologists or Biological Monitors that prohibit or impede open communication with CDFW, including but not limited to providing CDFW staff with the results of any surveys, reports, or studies or notifying CDFW of any non-compliance or take. Failure to notify CDFW of any non-compliance or take or injury of a Covered Species as a result of such agreement or contract may result in CDFW taking actions to prevent or remedy a violation of this ITP.
5.4	Education Program. PG&E shall conduct an education program for all persons employed or otherwise working in the Project Area before performing any work. The program shall consist of a presentation from the Designated Biologist or General Biological Monitor that includes a discussion of the biology and general behavior of the Covered Species, information about the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, its status pursuant to CESA including legal protection, recovery efforts, penalties for violations and Project specific protective measures described in this ITP. PG&E shall provide interpretation for non-English speaking workers, and the same instruction shall be provided to any new workers before they are authorized to perform work in the Project Area. Upon completion of the education program, employees or contractors shall sign a form or equivalent acknowledging that they attended the program and understand all protection measures. This training shall be repeated at least once annually for long-term and/or permanent employees or contractors that shall be conducting work in the Project Area.
5.5	Covered Activity Monitoring Documentation. When biological monitoring is required per Condition of Approval 6.4 (Compliance Monitoring) or when required for conducting Covered Activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement) and minor new construction in modeled habitat, the Monitoring Biologist(s) shall maintain monitoring documentation onsite in either hard copy or digital format throughout the duration of work, which shall include a copy of this ITP with attachments. PG&E shall ensure a copy of the monitoring documentation is available for review at the Work Area upon request by CDFW.
5.6	Trash Abatement. PG&E shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. PG&E shall ensure that trash and food items are contained in animal-proof containers and removed, ideally at daily intervals but at least once a week, to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.
5.7	Dust Control. PG&E shall implement dust control measures during construction activities to facilitate visibility for monitoring of the Covered Species by Biological Monitors and crews. PG&E shall keep the amount of water used to the minimum amount needed and shall not allow water to form puddles.
5.8	Prohibition of Firearms. Firearms and domestic dogs shall be prohibited in work areas as well as from site access routes during construction and development of the project, except those firearms and domestic dogs that are in the possession of authorized security personnel or local, state, or federal law enforcement officials.

Table 5.4-11. Relevant CDFW Measures from the Bay Area O&M ITP

Measure No.	Text
5.9	**Erosion Control**. PG&E shall implement and install all erosion and sediment control measures and devices prior to conducting Covered Activities that include grading, excavation, or placement of fill. PG&E shall utilize erosion control measures where sediment runoff from exposed slopes or surfaces could enter a drainage, stream, wetland or pond. PG&E shall repair and/or replace ineffective measures or contrivances whose integrity has been compromised immediately.
5.10	**Erosion Control Materials**. PG&E shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as monofilament netting (erosion control matting) or similar material, in potential Covered Species' habitat.
5.11	**Clean Vehicles.** PG&E shall implement the following: 5.11.1 Mud and/or accumulated soils shall be removed from equipment and vehicles to the maximum extent practicable. 5.11.2. Vehicles and equipment shall be cleaned or washed before entering a new work site. 5.11.3 A log shall be kept for each work site and shall be completed to document each cleaning or washing of vehicles or equipment before entering each new work site. 5.11.4 Vehicles shall be staged and stored on paved or cleared areas to the extent practicable. 5.11.5 Certified weed-free mulch, straw, hay bales, or equivalent materials shall be used where necessary.
5.12	**Delineation and Avoidance of Sensitive Habitat Features.** A Designated Biologist shall clearly identify sensitive resources that crews must avoid for the duration of the activities with posted signs, posting stakes, flags, and/or rope or cord, and place fencing as necessary to minimize or avoid disturbance.
5.13	**Work Area Access.** To the extent practicable, project-related personnel shall access a work area using existing routes, and shall not cross Covered Species' habitat outside of or en route to a work area. PG&E shall restrict project-related vehicle traffic to established roads, staging, and parking areas to the maximum extent practicable. PG&E shall ensure that vehicle speeds do not exceed 15 mph to avoid Covered Species on or traversing the roads.
5.14	**Staging Areas.** PG&E shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to a Work Area using, to the extent possible, previously disturbed areas. No staging areas shall be located in chaparral or scrub habitats, over rock outcroppings or within 300 feet of a stock pond or vernal pool.
5.15	**Hazardous Waste.** PG&E shall immediately stop and, pursuant to pertinent state and federal statutes and regulations, arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. PG&E shall properly contain and dispose of any unused or leftover hazardous products offsite.
5.16	**Pesticides.** At no time shall PG&E utilize broadcast baiting of rodenticides within the project area. When pesticides are used, PG&E shall follow all applicable state and federal laws, County Agricultural Commissioner regulations, label requirements, and when applicable, according to requirements in habitat management plans associated with ITP 8.5 (Habitat Acquisition and Protection)[21].
5.17	**CDFW Access.** PG&E shall provide CDFW staff with reasonable access to Work Areas and mitigation lands under PG&E control and shall otherwise fully cooperate with CDFW efforts to verify compliance with or effectiveness of mitigation measures set forth in this ITP.
5.18	**Refuse Removal.** Upon completion of construction activities within a work area, PG&E shall remove from, and properly dispose of all temporary fill and construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

[21] PG&E may elect to provide for the acquisition, permanent protection, and perpetual management of habitat mitigation lands to complete compensatory mitigation obligations (ITP 8.5; CDFW 2022b).

Table 5.4-11. Relevant CDFW Measures from the Bay Area O&M ITP

Measure No.	Text
Monitoring, Notification, and Reporting Provisions	
6.1	**Notifications Before Commencement of Certain Activities.** Notifications shall be submitted at least 45 days in advance and prior to "release to construction" by the Designated Representative for review by CDFW. Within 14 days of request by CDFW and if not possible then at least 5 days prior to the beginning of the Covered Activity, PG&E shall provide any requested additional information and provide access for a CDFW field review of the proposed Work Area. The proposed Covered Activity may not commence until PG&E has provided the additional information to the specifications of the request by CDFW, or until field review access has been provided to CDFW. If there continues to be unresolved issues or questions, then PG&E or CDFW may request to meet and confer within 10 business of the request to resolve any outstanding issues. CDFW retains the right to determine whether a proposed Covered Activity shall not be provided coverage under this ITP.
6.4	General Compliance Monitoring. The Designated Biologist shall be onsite: ▪ Daily when Covered Species are encountered within a work area; ▪ At the determination of the Designated Biologist, when Covered Species are relocated outside a work area to monitor and assess relocation success; ▪ When required by species-specific ITP measures. A Biological Monitor shall be onsite: ▪ Daily when construction activities are conducted in [BAHCP] modeled habitat; ▪ when required by species-specific ITP measures. For construction activities in Covered Species modeled habitat that required work over a period of two weeks or greater, a General Biological Monitor shall conduct compliance inspections, at a minimum, once very week after clearing, grubbing, and grading are completed and during periods of inactivity. The General Biological Monitor shall conduct compliance inspections to: 1. Minimize incidental take of the Covered Species; 2. Prevent unlawful take of species; 3. Check for compliance with all measures of the ITP; 4. Check all exclusion zones; 5. Ensure that signs, stakes, and fencing are intact, and that construction activities are only occurring in the pre-designated project footprint. The Designated Representative or Monitoring Biologist shall prepare daily written observation and inspection records summarizing oversight activities and compliance inspections, observations of Covered Species and their sign, survey results, and monitoring activities required by this ITP.
6.8	**Observations.** The Designated Biologist or PG&E shall submit all observations of Covered Species to CDFW's California Natural Diversity Database within 60 calendar days of the observation and the PG&E shall include copies of the submitted forms with the next Annual Summary Report or 5-year compliance report. If observations occur on lands not owned in fee title by PG&E, then PG&E may elect to inform the landowner of an observation. If the landowner objects to submission of the observation, then PG&E may elect to not submit.
6.10	**Notification of Take or Injury.** PG&E shall immediately notify the Designated Biologist if a Covered Species is taken or injured by a project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the project. The Designated Biologist or Designated Representative shall provide initial notification to CDFW by calling the Regional Office at (707) 428-2002. The initial notification to CDFW shall include information regarding the location, species, and number of animals taken or injured and the ITP Number. Following initial notification, PG&E shall send CDFW a written report within two working days. The report shall include the date and time of the finding or incident, location of the animal or carcass, and if possible, provide a photograph, explanation as to cause of take or injury, and any other pertinent information.
Take Minimization Measures	
7.1	**Equipment Fueling.** No vehicles or heavy equipment shall be refueled within 100 feet of a wetland, stream, or other waterway, or within 250 feet of vernal pools, unless secondary containment is used. The fueling operator must always stay with the fueling operation. Tanks may not be topped off. If refueling must be conducted closer to wetlands, construct a secondary containment area subject to review by an environmental field specialist and/or biologist. PG&E shall maintain spill prevention and cleanup equipment in refueling areas. Sufficient spill containment and cleanup equipment shall be present at all mobile, temporary, and permanent equipment fueling locations.

Table 5.4-11. Relevant CDFW Measures from the Bay Area O&M ITP

Measure No.	Text
7.2	**Lighting.** PG&E shall ensure that all artificial outdoor lighting be limited to lighting for safety and security, and designed using Illuminating Engineering Society's design guidelines, International Dark-Sky Association-approved fixtures, or other industry standards that address lighting impacts. Lighting above ground level shall be directed downward or inward, where consistent with safety concerns, and shielding shall be utilized, where needed, to minimize light scatter offsite. Light fixtures shall have non-glare finishes that shall not cause reflective daytime glare.
7.3	**Construction Activities Hours.** Construction activities shall cease 30 minutes before sunset and shall not begin prior to 30 minutes after sunrise, to the extent practicable. Emergency night work shall be limited in extent, duration, and brightness, to the extent feasible. For Covered Activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction, work may not occur at night during rain events in CTS habitat within 0.5 miles of known or potential breeding habitat between November 1 and April 30 unless otherwise authorized by CDFW. Covered Activities shall not occur at night for non-emergency work in California freshwater shrimp habitat any time of year unless otherwise authorized by CDFW.
7.4	**Stored Materials Inspections.** Workers shall thoroughly inspect for AWS and CTS in all construction pipe, culverts, or similar structures with a diameter of 7.6 centimeters (3 inches) or greater that are stored for one or more overnight periods before the structure is subsequently moved, buried, or capped. If during inspection one of these animals is discovered inside the structure, workers shall notify the Biological Monitors) and allow the Covered Species to safely escape that section of the structure before moving and utilizing the structure or moved out of harm's way by a Designated Biologist.
7.5	**Cover or Ramp Open Excavations.** Trenches or pits shall be covered or equipped with an escape ramp if left overnight in Covered Species modeled habitat. Crews shall inspect any trench, pit, or hole every morning prior to conducting construction activities to ensure no individuals are trapped; if any animals are found staff shall contact the Designated Biologist(s) to identify whether it is a Covered Species and if so, it shall be moved out of harm's way by the Designated Biologist(s). If the animal is not a Covered Species, then a General Monitoring Biologist or other individual with wildlife handling experience in possession of any applicable handling permits may move it out of harm's way.
7.6	**Spoils Stockpiles**. PG&E shall ensure that soil stockpiles are placed where soil shall not pass into wetlands or any other "waters of the state," in accordance with CFGC section 5650. PG&E shall cover and protect stockpiles to prevent soil erosion, including wind and rain. Spoils shall be placed away from chaparral habitat, rock outcroppings, and concentrated ground squirrel, pocket gopher, or other small mammal burrows or habitat features suitable for use by the Covered Species as refugia habitat.
7.7	**Screen or Cap Hollow Pipes or Posts.** All hollow pipes or posts that are installed as part of construction activities, or encountered in a work area that PG&E owns or is responsible for that are above ground shall be capped, screened, or filled with material by PG&E prior to the end of the day in which installation occurs.
7.8	**Equipment Inspections.** Workers shall inspect for Covered Species under vehicles and equipment before the vehicles and equipment are moved. If a Covered Species is present, the worker shall notify the Biological Monitors and wait for the Covered Species to move unimpeded to a safe location. Alternatively, PG&E shall contact a Designated Biologist to determine if they can safely move the Covered Species out of harm's way in compliance with the ITP.
7.9	**No Barriers to Covered Species Movements.** PG&E shall construct access routes such that there are no steep curbs, v-ditches, berms, straw wattles, or dikes that could prevent Covered Species from traversing through ROWs or from exiting roadways. If curbs/ berms/straw wattles are necessary for safety and/or surface runoff, PG&E shall design and construct them to allow Covered Species to move over them. PG&E shall modify or remove exclusion fencing at the request of Biological Monitors or CDFW staff that may impede Covered Species movements.

Table 5.4-11. Relevant CDFW Measures from the Bay Area O&M ITP

Measure No.	Text
Alameda Whipsnake Specific Conditions	
7.17	**Alameda Whipsnake Pre-Activity Habitat Features Survey.** Preconstruction surveys for Alameda whipsnake and sheltering and sunning habitat features (e.g., burrows, rocky outcrops, fallen trees, etc.) shall be conducted in modeled core and perimeter core habitat for construction activities (also refer to ITP 7.19 for survey requirements in core habitat). These surveys shall be conducted by a Designated Biologist no more than 30 calendar days prior to any initial ground disturbance. These surveys shall consist of walking the work area and, if possible, any accessible adjacent areas within at least 50 feet of the work area. The Designated Biologist shall investigate potential cover sites when it is feasible and safe to do so. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, tree cavities, and debris. Sheltering, sunning, or other sensitive species features identified by the Designated Biologist shall be identified with flagging. PG&E shall avoid habitat features flagged by the Designated Biologist to the extent practicable. At the recommendation of the Designated Biologist, PG&E shall install an exclusionary barrier (ITP 7.18).
7.18	**Exclusionary Barrier.** PG&E shall install a temporary barrier, where feasible, to prevent the Covered Species from dispersing into the work area, including along construction access routes, prior to commencing any other construction activities. The barrier shall be installed immediately after the preconstruction surveys have been completed in accordance with ITP 7.17 and shall consist of fencing at least 42 inches tall with 36 inches above the soil surface, designed with a lip to prevent the Covered Species from climbing over the barrier, and buried to a depth of six inches below the soil surface. The soil shall be compacted against both sides of the fence to prevent the Covered Species from gaining access. The stakes shall be placed on the inside of the fence. No gaps or holes are permitted in the fencing system except for access areas as required for vehicular and pedestrian traffic. The exit/entry points shall be constructed so that it is flush to the ground and so that the Covered Species cannot access the work area. The barrier shall be designed to allow trapped individuals to leave the work area by installing one-way funnels, ramps, or other methods approved by CDFW. An alternative barrier design or directional treatment techniques in lieu of fencing may be used after receiving written authorization from CDFW. The Designated Biologist or General Monitoring Biologist shall inspect the barrier daily and the barrier shall remain in place until all construction activities have been completed or where recommended by a Designated Biologist. PG&E shall maintain and repair barrier immediately, if damaged, to ensure that it is functional and without defects. PG&E shall provide refuge opportunities along or near the outer side of the silt fence for the Covered Species (also refer to ITP 7.19).
7.19	**Refugia Coverboards.** Coverboards shall be installed in work areas as determined by the Designated Biologist in modeled core and perimeter core habitat prior to construction activities. When coverboards are recommended, they shall be placed to provide refuge for the Covered Species [AWS] fleeing the area, including areas where a directional treatment methodology is used (e.g., phasing a project to encourage Covered Species [AWS] to move towards core habitats and away from potentially harmful environs). When coverboards are recommended, they shall be inspected at the end of each workday by a General Monitoring Biologist and use by wildlife shall be recorded.
7.20	**Alameda Whipsnake Clearance Surveys.** Immediately prior to the start of construction activities impacting greater than 0.1 acre that affects core AWS habitat, including scrub or chaparral plant communities in modeled habitat, the Designated Biologist(s) shall visually survey the work area and adjacent areas, as determined by the Designated Biologist, to clear the area of AWS. If construction activities may affect habitat features flagged per ITP 7.17 then a General Biological Monitor shall conduct daily clearance surveys in the active work area(s).
7.21	**Alameda Whipsnake Pre-Activity Tailboards.** The Designated Biologist or General Biological Monitor may prescribe activity-specific tailboards trainings reminding staff of the importance of following measures to minimize impacts on AWS as they relate to the work site. Site-specific tailboards are be conducted for staff working on construction activities that impact greater than 0.1 acre in core habitat or perimeter core habitat.
7.22	**Suspected Alameda Whipsnake in Work Area.** If AWS is found by any person in the work area before or during construction activities, all work that could potentially injure the snake shall stop immediately and the snake shall be allowed to leave the work area on its own. If the snake does not leave the work area or cannot move to an area with sufficient habitat outside of the work area, the Designated Biologist shall move the snake to suitable habitat outside the work area. Construction activities shall resume only after the snake has been confirmed to be out of the work area.

Table 5.4-11. Relevant CDFW Measures from the Bay Area O&M ITP

Measure No.	Text
7.23	**Alameda Whipsnake Seasonal Restrictions.** Disturbance in AWS modeled core and perimeter core habitat shall only take place between April 15 and October 31 to the extent feasible when AWS is more active and less likely to be affected by construction activities. For activities occurring in AWS core or perimeter core habitat between November 1 and April 14, a Designated Biologist(s) shall be present during operations.
7.24	**Alameda Whipsnake Injury.** If an AWS has major or serious injuries as a result of construction activities, the Designated Biologist shall immediately take it to a qualified wildlife rehabilitation or veterinary facility. PG&E shall bear any costs associated with the care or treatment of such injured AWS. If the injury is minor or healing and the AWS is likely to survive as determined by the Designated Biologist, it shall be released immediately to an area out of harm's way. PG&E shall notify CDFW of the injury to the AWS within 2 working days by telephone and e-mail followed by a written incident report to CDFW. Notification shall include the name of the facility where the animal was taken.

Table 5.4-12. Relevant Applicant-Proposed Measures from the ITP FEIR

Measure No.	Text
ITP FEIR APM BIO-1	**Prevent or minimize the spread of invasive weeds.** The following will be implemented on E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction to prevent the spread of invasive weeds during all phases of covered activities, as appropriate: ▪ During covered activities involving ground disturbance, mud and/or accumulated soils will be removed from equipment and vehicles to the extent feasible. Vehicles and equipment will be cleaned or washed before entering a new work site. A log will be kept for each job site and would be completed to document each cleaning or washing of vehicles or equipment before entering each new work site. ▪ Vehicles will be staged and stored on paved or cleared areas whenever feasible. Certified weed-free mulch, straw, hay bales, or equivalent materials will be used where necessary for covered activities.
ITP FEIR APM BIO-2	**Protect special-status wildlife encountered while performing covered activities and report covered wildlife observations.** Any special-status wildlife species encountered during the course of a covered activity will be allowed to leave the area unharmed, and work activities that could disturb or harm the individual will halt until the wildlife has left the area. Encounters with a special-status species will be reported to a qualified biologist and PG&E Environmental staff. PG&E will maintain records of all covered wildlife species encountered during permitted activities. Encounters with covered wildlife species will be documented and provided to CDFW in an annual report as required by the ITP. If a covered wildlife species is encountered during the course of operations, the following information will be reported for each species: ▪ The locations (i.e., narrative, vegetation type, and maps) and dates of observations, including occurrences observed during any required surveys. ▪ The general condition of individual health (e.g., apparent injuries). ▪ If the species is moved, the location where the species was captured and the location where it was released. ▪ The locations, dates, and species and behaviors observed during covered wildlife monitoring. When conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction PG&E will document encounters with special-status species to the same level of detail as required for covered species. During PG&E's environmental screening process, PG&E will also apply this measure to other covered activities to protect special-status species and habitats based on recommendations from qualified biologists. This data will be provided in ITP annual reports.

Table 5.4-12. Relevant Applicant-Proposed Measures from the ITP FEIR

Measure No.	Text
ITP FEIR APM BIO-3	**Design and site minor new construction projects activities to avoid sensitive areas.** New, permanent facilities as part of minor new construction activities will be sited and designed to avoid impacts on sensitive vegetation types, sensitive natural communities, and unique plant assemblages, as well as occupied habitat and suitable habitat for special-status species, to the extent feasible. If impacts on these areas cannot be avoided, PG&E will determine if additional permitting is required to conduct the work and obtain the required permits (e.g., LSAA). If impacts are expected on covered species' habitat, Mitigation Measure BIO-1[22] (MM BIO-1) [replaced with ITP Habitat Management land Acquisition and Restoration measures] will be implemented to mitigate for habitat impacts. Where minor new construction would result in impacts on sensitive vegetation types, sensitive natural communities, or unique plant assemblages, PG&E will minimize the construction footprint and implement appropriate protective measures as recommended by the qualified biologist to protect the natural community. Examples of such measures include: reseeding with a California annual seed mix, installing protective fencing around sensitive natural communities or resources, and installing wattles, erosion blankets and other drainage controls to protect new or adjacent plantings.
ITP FEIR APM BIO-3a	**Minimize spread of invasive plant and plant pathogens in minor new construction.** When conducting minor new construction activities, PG&E will avoid or minimize the spread of invasive species by taking the following actions: 1. Prior to commencement of activities located on or adjacent to non-paved surfaces, a qualified biologist will flag known populations of noxious weeds and invasive plants in the work areas. Invasive plant species include those listed as invasive by the California Invasive Plant Council (Cal IPC). 2. PG&E will stage work in areas not infested with weeds or treat for weed removal prior to using an infested area. 3. Prior to ground disturbance in areas containing species susceptible to Sudden Oak Death, a qualified professional (e.g., biologist, arborist, botanist familiar with Sudden Oak Death and the vegetation communities in the area) will assess the risk of activities and will identify and implement measures to reduce or avoid the risk of Sudden Oak Death spread. These measures will include but will not be limited to the following, and will be further developed and updated based on the best available science and site-specific conditions: a. Designate quarantine areas and implement proper measures for disposal of infested materials (e.g., branches, split wood, wood chips), b. Sanitize shoes, pruning gear, and other equipment with sanitizing materials (e.g., chlorine bleach, Clorox Clean-up, Lysol, scrub brush, boot brush) before and after ground-disturbing and vegetation removal activities are implemented, 4. Clothing, footwear, and equipment used during minor new construction will be cleaned of soil, seeds, vegetation, or other debris or seed-bearing material before entering a work site or when leaving an area with infestations of invasive plants and noxious weeds. **5.** Heavy equipment and other machinery used in areas with infestations of invasive plant species or Sudden Oak Death will be inspected for the presence of invasive species before use on the project site and will be cleaned before entering the site, to reduce the risk of introducing invasive plant species or plant pathogens.

[22] The ITP FEIR presented mitigation measures that were superseded by the measures included in the ITP as a condition of approval.

Table 5.4-12. Relevant Applicant-Proposed Measures from the ITP FEIR

<table>
<tr><th>Measure No.</th><th>Text</th></tr>
<tr><td>ITP FEIR APM BIO-3a (continued)</td><td>6. To minimize the introduction and spread of noxious weeds and invasive plants, PG&E will avoid moving weed-infested gravel, rock, and other fill materials to relatively weed-free locations. In areas where invasive plants are removed during minor new construction or vegetation removal activities, PG&E will dispose of invasive plant biomass offsite at an appropriate waste collection facility or treat biomass onsite to eliminate seeds and propagules and prevent reestablishment; if moved offsite, PG&E will transport invasive plant material in a closed container or bag to prevent the spread of propagules during transport. PG&E will use certified weed-free straw and mulch for erosion-control projects. PG&E will maintain stockpiled, uninfested material in a weed-free condition.
7. Areas where ground disturbance has resulted in exposed soil as a result of minor new construction shall be seeded with compatible California annual species, as determined by a qualified biologist or botanist familiar with the native vegetation in the area and experienced in revegetation techniques. Revegetation will occur prior to the onset of winter rains within the year initial impacts take place. If work cannot feasibly be scheduled he rainy season, revegetation may occur as directed by the qualified biologist and no later than the onset of the next winter rains.To ensure a successful revegetation effort, onsite vegetation shall meet the following success criteria:
a. PG&E shall perform pre-activity surveys to record baseline vegetative ground cover conditions and composition by a qualified biologist prior to covered activities as follows. The biologist will record the following:
i. Absolute percent ground cover for the entire work area.
ii. Relative percentages of ground cover within the work area by herbaceous plants, shrubs, trees, and noxious/invasive plants.
iii. Develop a catalog of all invasive species present within the work area, including an estimate of percent composition by species.
b. PG&E will conduct post-activity monitoring of work areas in the spring following completion of minor new construction.
i. A qualified biologist will record any new invasive species that may have inadvertently been introduced to the work area. The biologist shall make special note of any new invasive plant species rated as "high" by the Cal IPC.
ii. A qualified biologist will record whether there was an increase in relative cover of invasive species from baseline that may have resulted from the covered activity.
iii. If relative cover of invasive plant species has increased within the work area, PG&E shall remove and/or dispose of invasive plants in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor. If any new invasive plants rated by Cal IPC as "high" are found within the work area, they will be removed in an appropriate manner, as recommended by a qualified biologist and/or a Pest Control Advisor.
If the relative ground cover of invasive plants exceeds baseline by 100 percent or more, PG&E will reseed the areas where invasive plants are removed and monitor for one additional year.</td></tr>
<tr><td>ITP FEIR APM BIO-4</td><td>Avoid special-status plants. Occurrences of special-status plant species will be avoided to the extent practicable and will include performance of project activities in special-status plant habitat after senescence. PG&E has created "Map Book zones" for the 13 state or federally listed plants that are covered in the O&M HCP. A Map Book zone is defined as an area of occupied or potentially occupied the HCP- covered plant species habitat as determined by PG&E botanical surveys. When rare and endangered plant species subject to the Native Plant Protection Act cannot be avoided, PG&E will follow the requirements of California Fish and Game Code Sections 1913(b) and 1913(c) concerning notification to CDFW at least 10 days in advance and provide an opportunity to salvage such species. If a special-status plant is found or known to occur, the plant will be avoided if feasible (i.e., O&M objectives could still be met). If feasible to avoid, avoidance will include establishing a buffer around the plants and demarcation of the buffer by a qualified biologist or botanist using flagging. Consideration of site-specific environmental factors such as terrain, site hydrology, light, and potential introduction of invasive plants may inform the avoidance approach.</td></tr>
</table>

Table 5.4-12. Relevant Applicant-Proposed Measures from the ITP FEIR

Measure No.	Text
ITP FEIR APM BIO-5	Erect wildlife flagging or exclusion fencing. Prior to construction or commencement of any activity that, in the absence of fencing, is likely to directly or indirectly adversely affect covered species, flagging or exclusion fencing for the species will be installed around the perimeter of the activity footprint[23], or otherwise to ensure species protection. Any exemption or modification of flagging or exclusion fencing requirements will be based on the specifics of the activity, site-specific population, or habitat parameters. Sites with low population density and disturbed, fragmented, or poor habitat will likely be candidates for flagging or fencing requirement exemptions or modifications. Substitute measures, such as onsite Biological Monitors in the place of the flagging or fencing requirement, will be performed as appropriate. Prior to flagging or fencing, the qualified individual will ensure (to the extent feasible) that covered special-status species are absent from the activity footprint. After an area is flagged or fenced, PG&E is responsible for ensuring that covered special-status species flagging or fencing is maintained and opened/closed appropriately during project activities and regularly inspected for damage, which will be repaired as soon as possible. This measure will also be applied when conducting covered activities E9a (Reconductoring), G9 (Pipeline Lowering), G11 (Pipeline Replacement), and minor new construction when these activities are likely to adversely affect special-status species. PG&E may also apply this measure to other covered activities to protect special-status species and habitats based on recommendations from qualified biologists.
ITP FEIR APM BIO-6	Protect nesting birds. All vegetation clearing and ground-disturbing activities will be conducted outside of the nesting season (generally March 1–August 31) to the extent feasible. If this is not feasible, a biologist or qualified individual will determine if preconstruction activity surveys, nest buffers, and/or monitoring are needed in accordance with PG&E's Nesting Bird Management Plan. Nesting bird surveys will be scheduled to occur within a timeframe prior to construction the activity that is suitable for the detection of recently established nests. If active nests containing eggs or young are found, the qualified biologist or individual will establish an appropriate nest buffer in accordance with the species-specific buffers in PG&E's Nesting Bird Management Plan. Nest buffers under the Plan will be species-specific and can range from 15 to 100 feet for passerines, 50 to 300 feet for raptors, or larger if necessary, depending on the planned activity's level of disturbance, site conditions, and the observed bird behavior. Covered activities will not commence within the established buffer areas until the qualified biologist or individual determines that the young have fledged or the nest is no longer active. Active nests will be periodically monitored until the young have fledged or the activity all construction is finished. If birds with active nests are observed showing behavioral signs of agitation (e.g., standing up from a brooding position, flying off the nest) during covered activities, the buffer will be increased to a distance in which the behavioral signs of agitation cease, in accordance with PG&E's Nesting Bird Management Plan.

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

Table 5.4-12. Relevant Applicant-Proposed Measures from the ITP FEIR

Measure No.	Text
ITP FEIR APM BIO-7	**Avoid and protect special-status bats.** When feasible, activities directly affecting bat roosting habitat will be conducted outside of the bat breeding/pupping season (generally, April through mid-September). If work that would affect known bat breeding sites must be done in the bat breeding/pupping season, a qualified biologist would evaluate known breading/roosting sites or conduct surveys for bat roosts in suitable breeding/roosting sites (e.g., bridges, mines, caves, trees with hollows, palm trees, snags, buildings, long and dark culverts, rock outcrops, dense tree canopies, and flaking tree bark). If evidence of a bat maternity roost is found or maternity roosts are detected, PG&E will avoid conducting covered activities that may directly affect the active roost site, including the following: ▪ If a maternity roost is identified then the qualified bat biologist will develop a Bat Avoidance and Monitoring Plan prior to the start of project activities that shall include: (1) an assessment of all impacts to bats from the activity, including noise disturbance during covered activities and (2) effective AMMs to protect bats in order to ensure that direct impact to active bat maternity roost site do not occur. Notification will be provided to CDFW prior to the start of covered activities. The notification will include a copy of the Bat Avoidance and Monitoring Plan. If direct impacts to identified maternity roost sites cannot be avoided, PG&E will provide a compensatory mitigation plan to CDFW for review and approval. ▪ As necessary, an exclusionary buffer will be maintained around active roosts. The size of the buffer will be determined by the qualified biologist based on factors such as the planned activity's level of disturbance and site conditions and will typically be 250 feet. ▪ As necessary, a qualified biologist will monitor active bat roost site buffers during O&M activities to determine if roosting activity is influenced by noise or vibrations until a qualified biologist has determined if the young bats are volant (about to fly) or the roost is unoccupied. When feasible, to protect bats and in accordance with BAHCP BMP-30[24] tree work near riparian zones will be conducted during the dry season. If it is not feasible to conduct tree work during the dry season, operations will occur between rain events or during dry spells unless there is an emergency or imminent threat to life or property.

Project-specific Applicant-Proposed Measures for Species Not Covered for Take In the BAHCP/ITP

In addition to the two covered species, CRLF (HCP) and AWS (HCP and ITP), several other special-status or protected species potentially may be impacted by the project, including Crotch's bumble bee, monarch butterfly, FYLF, Northwestern pond turtle, San Francisco dusky-footed woodrat, bats, and nesting birds. The BAHCP and ITP adopt measures such as restricted work area access, speed limits, training and monitoring, equipment inspection, erosion control, trench inspections and ramps for wildlife, and other general measures that extends protection to non-covered species. The ITP FEIR APMs also provide protection for non-covered species, including bats and nesting birds. The following additional project-specific APMs (Moraga–Oakland X 115 kV Rebuild [MOX] APMs) for species not covered by the BAHCP or ITP will be implemented to further minimize impacts as appropriate. Refer to Appendix B6 for species-specific buffers for nesting birds (MOX APM BIO-5). Refer to Attachment D of Appendix B3 for the San Francisco dusky-footed woodrat relocation plan (MOX APM BIO-6).

MOX APM BIO-1: Preconstruction Surveys and Biological Monitoring

To reduce impacts to sensitive biological resources that may be present within and adjacent to work areas, clearance surveys and preconstruction surveys will be implemented at the discretion of the PG&E biologist.

[24] BMP-30 from the BAHCP: When possible, activities near streams, wetlands, or on saturated soils shall be conducted during the dry season (generally May 15–October 15) or during periods of minimum flow. If it is not possible to perform the work in the dry season, perform rainy season work during dry spells between rain events. For the purposes of this project, a riparian zone will have a buffer distance of 250 feet.

MOX APM BIO-2: Crotch's Bumble Bee and Monarch Butterfly

The CDFW ITP FEIR concluded that implementation of the HCP and ITP measures (such as FP-01 through FP-04, FP-07, FP-10, FP-11, FP-12, and FP-14) will reduce the level of impact to less than significant for the Crotch's bumble bee; in this APM, these same measures are being extended to include the Monarch butterfly, which was not addressed in the HCP or ITP.

MOX APM BIO-3: Foothill Yellow-legged Frog

Applicable measures from PG&E's BAHCP, including FP-01 through FP-08, FP-10 through FP-17, and AMM Wetland-2 (Tables 5.4-9 and 5.4-10) also will minimize impacts to FYLF. All special-status amphibians encountered in the work areas will be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area in accordance with ITP FEIR APM BIO-2 (Table 5.4-12).

MOX APM BIO-4: Northwestern Pond Turtle

The measures FP-01 through FP-17 from PG&E's BAHCP and AMM Wetland-2 to minimize potential impacts to CRLF and wetlands also will minimize impacts to Northwestern pond turtle (Tables 5.4-9 and 5.4-10).

MOX APM BIO-5: Nesting Birds

PG&E will implement FP-01 through FP-18 from PG&E's Bay Area O&M HCP as well as ITP FEIR APM BIO-6 to avoid and minimize impacts to nesting birds (Tables 5.4-9 and 5.4-12). As both helicopter and drone use are proposed for this project, the established nest buffers will include vertical buffers based on the horizontal ground buffers presented in Nesting Birds: Species-Specific Buffers for PG&E Activities (Appendix B6).

MOX APM BIO-6: San Francisco Dusky-footed Woodrat

Measures FP-01 through FP-17 from the BAHCP (Table 5.4-9) also will reduce impacts to dusky-footed woodrat. Any woodrat nests encountered in the work areas during covered activities will be reported to the project biologist or PG&E Environmental staff and individuals, if found, will be allowed to leave the work area (ITP FEIR APM BIO-2) (Table 5.4-12). If active nests are identified and cannot be avoided, PG&E will implement the dismantling and relocation measures described in Attachment D of Appendix B3.

5.4.4.3 Potential Impacts

The significance criteria used for determining standards of significance for biological resources were derived from Appendix G of the CEQA Guidelines. Potential impacts to vegetation, wildlife, and waters are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and operation and maintenance phase. Impact areas for aquatic resources are mapped on Figure 5.4-4 and impacts to Bay Area HCP modeled habitat for AWS and RLF are mapped on Figures 5.4-7 and 5.4-8. Figure 5.4-9 shows preliminary mapping of tree trimming and removals, subject to change based on CPUC requirements, final engineering, and other factors, and Figure 5.4-10 shows areas of connectivity. Impact acreages are provided in the following relevant subsections.

a) **Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? *Less-than-Significant Impact.***

The project will have a less-than-significant impact to any candidate, sensitive, or special-status species populations. The incorporation of applicable BAHCP measures (field protocols and AMMs), ITP measures, and ITP FEIR APMs, along with project-specific APMs (MOX APMs), further minimizes the potential for impact. CDFW, as not only the lead agency for the ITP CEQA analysis (ITP FEIR) but also the trustee agency for resources in California, addresses impacts to CEQA biological resources such as sensitive communities, riparian habitats, waters, and wetlands, and special-status species, including bees, western pond turtle, and bats, as well as impacts to the listed species covered in the ITP (CDFW 2022a). Mitigation for impacts to BAHCP modeled AWS and RLF habitat has been incorporated as described in those species specific discussions.

There is low potential for direct and indirect effects to occur during project implementation. The project will not result in significant impacts to candidate, sensitive, or special-status species, and no reduction in the distribution of these species will occur. Most of the project's habitat impacts will be temporary and impacted areas will be restored to pre-existing conditions following project activities.

Potential construction impacts from ground-disturbing activities will occur in the following locations:

- Two isolated staging areas located off Quarry Road within EBRPD's Sibley Volcanic Regional Preserve. Some vegetation removal and minor grading may be required in preparation for equipment staging, which may result in impacts to scrub habitat immediately adjacent to the work areas.
- Immediately west of Moraga Substation, where a network of access roads leads north to a staging area located at the southeastern end of the community of Wilder (Wilder LZ/SA). This staging area is elevated and will require some grading to establish an access route for vehicles.
- Work areas and staging areas along the circuit east of Manzanita Drive/Skyline Boulevard where vegetation removal and grading will be required.
- The access route to the staging area near structure EN9. The access route is an old two-track trail that is overgrown and cut off by a moderate landslide. Impacts are expected to mapped scrub habitat.

The only permanent impacts will be associated with foundations for the replacement structures. Project operation and maintenance will be conducted with existing staffing using existing access and no operation and maintenance impacts will occur. As discussed in greater detail in the following subsections, mitigation will be required for impacts to AWS and RLF per the HCP in the form of species credits where impacts overlap the appropriate modeled habitat (refer to Figures 5.4-7 and 5.4-8).

Special-Status Plant Species

Special-status plants may be damaged or destroyed as a result of vegetation removal or trimming activities before construction, by project vehicles traveling on access roads, or by staging project vehicles and equipment in construction work areas. Special-status plants also can be indirectly affected by soil compaction and the spread of non-native invasive species from project vehicle and equipment travel and staging. Three special-status plant species (pallid manzanita, Jepson's button thistle, and Oakland star-tulip) were observed during botanical field surveys and may be impacted by project activities. Although no special-status plant species were identified within the project footprint (impact area), there is potential for occurrence in later years of annual species not previously observed. The plant AMMs from the HCP will be implemented and, therefore, anticipated impacts are less than significant.

With implementation of measures from the BAHCP, ITP, and ITP FEIR (FP-01, FP-04, FP-10; ITP FEIR APM BIO-1, BIO-3a, BIO-4), both direct and indirect effects will be minimized (Tables 5.4-9, 5.4-11, 5.4-12). These measures include worker environmental awareness training, identifying, and avoiding sensitive resources, minimizing impacts to vegetation and habitats to the greatest extent feasible, weed management, and restoring temporary disturbance areas. The AMMs from the BAHCP will be implemented during activities that occur within the pallid manzanita MBZs (AMM Plant-01 through Plant-08) (Table 5.4-10). No herbicides will be used within 100 feet of the MBZs and the top 4 inches of topsoil will be stockpiled separately. Construction activities that will result in unavoidable impacts will be conducted after seeds have matured, plant material will be salvaged, and belowground disturbance will be minimized to the greatest extent feasible. With implementation of these BAHCP AMMs, potential impacts to pallid manzanita within the MBZs will be further reduced).

An additional nine species were determined to have the potential to occur within the botanical study and survey area but were not observed within areas of suitable habitat during appropriately timed botanical surveys. They are, therefore, not expected to be present or adversely affected during project activities. However, impacts to any special-status plants that may be present will be minimized with implementation of the measures described previously.

Special-Status Wildlife Species

Crotch's Bumble Bee

Crotch's bumble bee has potential to occur within the project footprint where grassland and floral resources, including ruderal and weedy areas, are present. Project activities, specifically ground disturbance and vegetation removal where floral resources and potential nest sites are present, could result in direct injury and mortality of the species. Potential indirect impacts include habitat fragmentation and alteration of the habitat structure and microclimate of the surrounding environment. Changes in habitat structure (vertical and horizontal distribution of plant life) and microclimate (such as solar radiation, temperature, relative humidity, and soil moisture) could negatively affect the behavior of Crotch's bumble bee in unforeseen ways in response to these changes.

Impacts to Crotch's bumble bee from activities covered by the HCP such as this project are addressed in the ITP FEIR. That analysis concluded that, with incorporation of AMMs from PG&E's Bay Area O&M HCP (FP-01 through FP-04, FP-07, FP-10, FP-11, FP-12, and FP-14), and because issuance of the ITP is not expected to result in substantially increased impacts from ongoing O&M and minor new construction, potential impacts on special-status bumble bees will be less than significant and no mitigation is required.

As described in MOX APM BIO-2, PG&E will incorporate measures from the BAHCP, including FP-01 through FP-04, FP-07, FP-10, FP-11, FP-12, and FP-14 (Table 5.4-9) to minimize potential impacts to Crotch's bumble bee (Section 5.4.4.2.1). Impacts to floral resources used by the species will be minimized by implementation of measures from the BAHCP, ITP, and ITP FEIR (FP-01, FP-04, FP-10, AMM Plant-01 through AMM Plant-08; ITP FEIR APM BIO-1, BIO-3a, BIO-4) (Tables 5.4-9 through 5.4-12). Furthermore, impacts to Crotch's bumble bee are addressed in the ITP FEIR (CDFW 2022a), which concludes that with the implementation of the BAHCP and ITP FEIR measures, these impacts are less than significant.

Monarch Butterfly

If project activities occur during the winter months, impacts to overwintering monarchs could occur if an overwintering population is identified. Overwintering monarchs are highly dependent on intact forested groves, so brush management (including tree trimming, tree removal, or tall shrub removal) within 328 feet (100 meters) of overwintering sites may negatively influence overwintering monarchs (EPRI 2019). If project activities occur during the migration and breeding season (starting as early as February through fall), monarchs could be present in the grassland utilizing nectar plants. No native milkweed plants were observed during the 2021 botanical surveys, and breeding is not expected. Movement of vehicles, removal of vegetation, and/or grading of roads that directly impacts milkweed plants if monarch larvae are found, could result in direct impacts to the species.

Per ITP FEIR APM BIO-2, general BAHCP measures implemented to minimize impacts to Crotch's bumble bee also will apply to monarch butterfly (Section 5.4.4.2.1). With implementation of these measures, these impacts are less than significant.

Foothill Yellow-legged Frog

FYLF have potential to occur in the vicinity of the work areas near Moraga Substation and the Wilder LZ/SA. There is an access road that travels between Moraga Substation and the Wilder LZ/SA that falls within the 1997 CNDDB occurrence. In this area (Attachment B of the Wildlife Assessment Report [Appendix B3]), PG&E modeled suitable breeding habitat for CRLF is assumed to also provide potentially suitable breeding habitat for FYLF. Impacts may occur during project activities, most likely during late winter through early spring and late summer through early winter when frogs are dispersing to and from creek breeding habitat. No direct impacts to breeding habitat are currently proposed to occur. However, movement of vehicles, removal of vegetation, and grading of roads could crush or bury metamorphs, juveniles, and adults in upland areas as well as individuals using adjacent aquatic areas for dispersal, basking, foraging, or sheltering.

Measures incorporated in the BAHCP and ITP FEIR for the protection of CRLF also will serve to reduce the potential impacts to FYLF to less-than-significant levels (refer to the CRLF discussion in the following subsection). AMM Wetland-2 requiring a 50-foot buffer around wetlands, ponds, and riparian areas, will be implemented to protect the species and both its aquatic and terrestrial habitats (Tables 5.4-9, 5.4-10). Any FYLF encountered in the work area will be allowed to leave unharmed and these encounters will be reported to PG&E in accordance with ITP FEIR APM BIO-2 (Table 5.4-12). Additionally, general ITP measures to protect AWS, such as vehicle speed limits and removing entrapment hazards, will be implemented to protect FYLF and other special-status species (ITP 5.12, 7.5, 7.7) (Table 5.4-11). If the species is present, the ITP FEIR concludes that, with inclusion of measures FP-01 through FP-08 and FP-10 through FP-17, and Wetland-02, which requires either a buffer of 50 feet around wetlands or a biological monitor, impacts on the foothill yellow-legged frog, a special-status amphibian, are considered less than significant and no mitigation is required.

California Red-legged Frog

CRLF have a potential to occur in the vicinity of the project footprint. Both direct and indirect impacts to the species may occur during work activities if individuals are present within work areas where PG&E modeled suitable breeding habitat exists (refer to Figure 5.4-7 and Table 5.4-13). Frogs are most likely to be impacted during the breeding season, especially at night or during rain events when they are most active. Suitable upland habitat is present at all work and staging areas within 200 feet from the community of Wilder to Skyline Boulevard (Attachment B of the Wildlife Assessment Report [Appendix B3]); impacts are most likely to occur in these areas. However, the species could potentially be found anywhere within the project footprint south/east of Park Boulevard within 200 feet of streams. While impacts could potentially occur within BAHCP modeled suitable breeding habitat, no direct impacts to known breeding habitat will occur. Movement of vehicles, removal of vegetation, and/or grading of roads could crush or bury metamorphs, juveniles, and adults in upland areas as well as frogs using adjacent aquatic areas for dispersal, basking, foraging, or sheltering.

The project will result in permanent impacts to 0.006 acre and temporary impacts to 4.525 acres of modeled breeding habitat as identified in the BAHCP (Figure 5.4-8 and Table 5.4-13)

Table 5.4-13. Anticipated Impacts to BAHCP Modeled Habitat for RLF

BAHCP Modeled Habitat Type	Temporary Impacts (acres)	Mitigation Ratio	Permanent Impacts (acres)	Mitigation Ratio	Mitigation Anticipated (acres)
Breeding Habitat	4.525	1:1	0.006	3:1	4.543

BAHCP measures and ITP FEIR APMs are designed to avoid and minimize impacts to this BAHCP covered species (Tables 5.4-9, 5.4-10, 5.4-12). Impacts to CRLF are addressed in the ITP FEIR (CDFW 2022a), which concludes that, with implementation of the BAHCP and ITP measures, these impacts are less than significant.

Mitigation for impacts to RLF is covered under the HCP and as shown in Table 5.4-13 will equal approximately 4.543 acres, with actual impact area verified at the end of construction and reported as part of HCP management. Habitat mitigation will be provided for covered species based on acreages of estimated and actual habitat losses consistent with "jump start and stay ahead" mitigation approaches, where "jump start" means land acquisition, preservation, and/or habitat enhancement efforts that are made in advance of permit issuance, and "stay ahead" means PG&E will stay ahead of its mitigation obligations by calibrating the mitigation credits that may be necessary for future years based on information from the Annual Report for the prior year.

Mitigation for habitat disturbance is overseen by PG&E's HCP team, who provide the Annual Report. By June 1 of each year, PG&E will submit an annual report to CDFW summarizing the mitigation ratios and credits that were debited from its mitigation credit portfolio for covered activities during the previous calendar year. In addition, the report will include survey and monitoring results of ITP-covered species in work areas, as required by MOX APM BIO-2. Mitigation is provided at the following ratios for RLF:

- 3:1 ratio for permanent impacts on modeled habitat (3 acres mitigated for every 1 acre permanently affected).
- 1:1 ratio for temporary impacts on modeled breeding habitat for RLF (0.5 acre mitigated for every 1 acre temporarily affected) when mitigation is provided according to jump start and stay ahead provisions. For the first 5 years, mitigation that is not in place prior to any impact will be at a 1:1 ratio.

Northwestern Pond Turtle

Although most of the work will be on hills and ridgelines away from potential aquatic habitat, the access road that travels between Moraga Substation and the Wilder LZ/SA is in areas where upland movement and nesting could occur. If Northwestern pond turtles are present in the upland habitat that surrounds the creeks, there is the potential for direct and indirect impacts within the work areas near creeks or ponds. While no direct impacts to known breeding habitat will occur, movement of vehicles, removal of vegetation, and grading of roads could crush or bury juveniles and adults in upland areas. Project activities along access roads that occur adjacent to aquatic areas could result in disturbances to turtles using those aquatic features for dispersal, basking, foraging, or sheltering. Construction activities (such as grading and movement of heavy equipment) could result in the destruction of pond turtle nests containing eggs or young individuals if affected areas are being used for egg deposition. Indirect impacts could occur if sediments or hazardous materials enter suitable pond turtle aquatic habitat or if increased human presence disrupts normal foraging behaviors or movement during the breeding season and could reduce local population size and lower reproductive success.

Measures incorporated in the BAHCP and ITP FEIR serve to reduce the potential impacts to Northwestern pond turtle to less than significant. Per the FEIR (refer to CRLF discussion previously), measures FP-01 through FP-17 from PG&E's Bay Area O&M HCP are designed to avoid and minimize impacts on Alameda whipsnake and other special-status reptiles. Additionally, general ITP measures to protect AWS, such as vehicle speed limits and removing entrapment hazards, will also protect Northwestern pond turtles (ITP 5.12, 7.5, 7.7) (Table 5.4-11). PG&E also will implement MOX APM BIO-5 for longer-term activities, requiring installation and maintenance of wildlife exclusion fencing and/or the presence of an onsite biological monitor. All special-status reptiles encountered in the work areas during covered activities will be reported to the project biologist or PG&E Environmental staff and allowed to leave the work area (MOX APM BIO-2). The ITP FEIR addresses impacts to the western pond turtle, concluding that, with incorporation of the previously noted measures, impacts on special-status reptiles, including Northwestern pond turtle, are considered less than significant and no mitigation is required (CDFW 2022a). With implementation of these measures, impacts will be less than significant.

Alameda Whipsnake

AWS is likely to occur within the project footprint, primarily east of Manzanita Drive/Skyline Boulevard (Attachment B of the Wildlife Assessment Report [Appendix B3]). Any project activity in this portion of the project footprint has the potential to result in both direct and indirect impacts to AWS if they are present within work areas. Direct impacts include both impacts on individuals that could be encountered during implementation of project activities and the permanent and temporary loss of modeled habitat. Some AWS core habitat and perimeter core habitat will be impacted with ground disturbance and temporary loss of vegetation associated with the project. The potential to affect AWS is greatest in these core and perimeter core habitats. Movement of vehicles, removal of vegetation, and grading of roads in movement habitats could result in take. AWS may be indirectly impacted by habitat fragmentation and spills.

The project will result in permanent impacts to 0.041 acre and temporary impacts to 14.683 acres of movement habitat as identified in the BAHCP (Figure 5.4-7). The BAHCP and ITP measures (Tables 5.4-9, 5.4-10, 5.4-11). are designed to avoid and minimize impacts to AWS and their habitat (Table 5.4-14). These measures, previously reviewed and approved by USFWS and CDFW, will be implemented for the project. Clearance surveys, preconstruction surveys, and monitoring will be conducted (ITP 6.4, 7.17, 7.20) (Table 5.4-11). Refugia coverboards will be installed as described in ITP 7.19 and seasonal work restrictions will be implemented as feasible (ITP 7.23). Injury and mortality of AWS will be addressed in accordance with ITP 7.24 and reported to CDFW.

Table 5.4-14. Anticipated Impacts to BAHCP Modeled Habitat for AWS

BAHCP Modeled Habitat Type	Temporary Impacts (acres)	Mitigation Ratio	Permanent Impacts (acres)	Mitigation Ratio	Mitigation Anticipated (acres)
Movement Habitat (non-core)	14.683	0.5:1	0.041	3:1	7.463
Core Habitat	None	-	None	-	None
Perimeter Core Habitat	None	-	None	-	None
Total					**7.463**

Mitigation for impacts to AWS is covered under the HCP, anticipated at 7.463 acres (Table 5.4-14), and is also addressed in the ITP FEIR, MM BIO-1: Acquire, preserve, and/or enhance suitable habitat for mitigation. PG&E will acquire, preserve, and/or enhance potential habitat, or purchase bank credits for AWS, to fully mitigate for the potential take of this species. Mitigation for habitat disturbance is overseen by PG&E's HCP team, who provide the Annual Report. By June 1 of each year, PG&E submits an annual report to CDFW summarizing the mitigation ratios and credits that were debited from its mitigation credit portfolio for covered activities during the previous calendar year. In addition, the report will include survey and monitoring results of ITP-covered species in work areas, as required by MOX APM BIO-2. Mitigation is provided at the following ratios for AWS:

- 3:1 ratio for permanent impacts on modeled habitat for AWS (3 acres mitigated for every 1 acre permanently affected).
- 0.5:1 ratio for temporary impacts on non-core (movement) habitat for AWS (0.5 acre mitigated for every 1 acre temporarily affected) when mitigation is provided according to jump start and stay ahead provisions. For the first 5 years, mitigation that is not in place prior to any impact will be at a 1:1 ratio.

Pallid Bat, Townsend's Big-eared Bat, and Western Red Bat

Pallid bat, Townsend's big-eared bat, and Western red bat have a moderate potential to occur within the project footprint given the presence of foraging habitat, maternity roost habitat, and day- and night-roosting habitat. Trees in and adjacent to the project footprint provide suitable roosting habitat within cracks and crevices of the tree and exfoliating bark or within the foliage. Tree removal or pruning and noise associated with project activities could result in the injury, mortality, or disturbance of roosting bats if present. Construction disturbance adjacent to bridges or other structures located in or near the project footprint could disturb bats that may roost on these structures (pallid bat, maternity colonies of non-special-status bats). Mortality of roosting bats during the maternity season or hibernation period that results from tree removal or pruning/trimming or other disturbances could affect individuals but is not expected to result in a substantial reduction in the local populations of these species. While the project footprint contains riparian trees that provide suitable roosting habitat, the project has been designed to avoid trimming or removal of riparian trees.

PG&E will implement ITP FEIR APM BIO-7 to avoid and minimize impacts to special-status bats (Table 5.4-12). Activities directly affecting bat roosting habitat will be conducted outside of the bat breeding/pupping season to the extent feasible. If work must be done in the bat breeding/pupping season, a qualified biologist will evaluate known breeding/roosting sites or conduct surveys for bat roosts in suitable breeding/roosting sites. If evidence of a bat maternity roost is found or maternity roosts are detected, impacts will be avoided via establishment of buffers, biological monitoring, or other means presented in the APMs. Impacts to special-status bats are addressed in the ITP FEIR, which concludes that with implementation of the ITP FEIR measure (ITP FEIR APM BIO-7), impacts are less than significant (CDFW 2022a).

San Francisco Dusky-footed Woodrat

San Francisco dusky-footed woodrat is present in the vicinity of the project footprint, as documented during the wildlife assessment and the November 2023 site visit. Suitable habitat is present throughout much of the project footprint in woodland habitat and it is likely other nests will be discovered near other work areas. Both direct and indirect impacts may occur during project activities. San Francisco dusky-footed woodrat may be directly impacted from ground disturbance and temporary loss of vegetation associated with the project. Direct impacts also may include injury and mortality of the species from project vehicle strikes and construction activities. The species may be indirectly impacted by habitat fragmentation and spills. If woodrat nests cannot be avoided by project activities, there is the potential for direct impacts associated with nest dismantling and relocation.

The general protection measures from the BAHCP, ITP, and ITP FEIR already described will be implemented to avoid and minimize impacts to San Francisco dusky-footed woodrat (Tables 5.4-9 through 5.4-12). Furthermore, impacts are addressed in the ITP FEIR, which concludes that, with implementation of the BAHCP and ITP FEIR measures, these impacts are less than significant ((CDFW 2022a). PG&E has an existing woodrat relocation plan agreement with EBRPD. To further reduce potential impacts to this species, PG&E will implement the relocation plan in the event a nest is found that cannot be avoided (Attachment D of Appendix B3) (MOX APM BIO-6).

Cooper's Hawk, Golden Eagle, and Birds Protected under the MBTA and CFGC Section 3503

Suitable foraging habitat is present in grasslands in the vicinity of all the work areas, and there is suitable nesting habitat for Cooper's hawk, golden eagle, and many other bird species in grasslands, trees, shrubs, wetland vegetation, and other substrates, including PG&E structures, throughout the project footprint and larger BSA. Nesting birds may be adversely affected if construction activities occur near active nests during the breeding season. If ground-nesting birds have active nests or have active burrows in and adjacent to the construction work areas, grading and excavation activities could result in removal of an occupied breeding or wintering breeding site, destruction of a ground nest, and loss of adults, young, or eggs, resulting in direct impacts. Direct impacts could also include nest removal or destruction or abandonment of chicks and eggs during vegetation removal or trimming activities to provide construction equipment access for work areas. Construction-related noise from heavy equipment, helicopter, etc. may also result in nest abandonment or premature fledging. The project may result in temporary and permanent impacts on nesting and foraging habitats such as annual grasslands, trees, shrubs, wetland vegetation, and other substrates. Removal of existing structures and vegetation removal could result in direct impacts on nesting special-status raptors and non-special-status migratory birds. Construction activities and use of a helicopter or drone could result in indirect loss of individual nesting birds or disruption to normal breeding activity.

With implementation of general protection measures from the BAHCP, ITP, and ITP FEIR, impacts to birds and their foraging and nesting habitats will be minimized. Additionally, to protect nesting birds during the breeding season, preconstruction nesting bird surveys will be conducted and active nests will be monitored (ITP FEIR APM BIO-6). Nest buffers will be established in accordance with Nesting Birds: Species-Specific Buffer for PG&E Activities guidance (Appendix B6). Vertical buffers also will be established to minimize impacts from helicopter and drone use during the nesting season (MOX APM BIO-5). Impacts to nesting birds are addressed in the ITP FEIR, which concludes that, with implementation of the BAHCP measures and the ITP FEIR APMs, impacts are less than significant.

Given the limited size of the work areas relative to the surrounding expanse of adjacent suitable nesting habitat areas, and the existing disturbed nature of the work areas in the western portion of the project footprint, the temporary loss of nesting habitat is not expected to adversely affect bird species.

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? *Less-than-Significant Impact*.

Impacts to all communities are summarized in Table 5.4-15. Riparian habitat and other sensitive communities are present in and near the project footprint (Figures 5.4-2, 5.4-3, and 5.4-6) and Table 5.4-16. Direct impacts to sensitive communities may occur as a result of vegetation removal or trimming activities before construction or along access roads, and by staging project vehicles and equipment in construction work areas. Riparian habitats and other sensitive communities can be indirectly affected by soil compaction and the spread of non-native invasive species from project vehicle and equipment travel and staging. Additional tree removal information is provided in the Sections 3.5.4.3 and 3.5.4.4 and Tables 3.5-4 and 3.5-5.

Table 5.4-15. Impacts to All Vegetation and Land Cover Types (CLN 2.0)

CLN Vegetation Mapping	Temporary Impacts (acres)	Permanent Impacts (acres)
Blue Oak	0.010	0.000
California Bay	0.375	0.002
Coast Live Oak	4.475	0.026
Coastal Mixed Hardwoods	0.973	0.002
Eucalyptus	1.812	0.004
Moderate grasslands	8.438	0.011
Non-native/Ornamental Conifer/Hardwood	1.406	0.003
Redwood	0.085	0.000
Urban/Developed	12.964	0.009
Total	**30.537**	**0.057**

Table 5.4-16. Impacts to Sensitive Natural Communities (Nomad 2022)

Community	Temporary Impacts (acres)	Permanent Impacts (acres)
Valley Needlegrass Grassland	0.584	0.002
Upland Redwood Forest	0.059	0.000
Total	**0.642**	**0.002**

There is potential for both direct and indirect impacts to riparian habitats (primarily along access roads and near Moraga Substation) and other sensitive communities from work activities being conducted in and near these habitats (refer to Figure 5.4-3 and Table 5.4-16). Little riparian habitat exists in the project study area, and only minor trimming of riparian habitat will be necessary to provide construction equipment access. As design progresses, precise potential impacts due to riparian tree removal if any, will be evaluated and if unavoidable, a 1600 Streambed Alteration Agreement may be required. This agreement would outline any additional measures required.

With implementation of measures from the BAHCP, ITP, and ITP FEIR described previously, both direct and indirect effects to the sensitive communities listed will be minimized (Tables 5.4-9, 5.4-11, and 5.4-12). These measures include worker environmental awareness training, identifying and avoiding sensitive resources, minimizing impacts to vegetation and habitats to the greatest extent feasible, managing weeds, and restoring temporary disturbance areas. Specific measures include ITP FEIR measure FP-01, which will reduce impacts on sensitive natural communities through worker education programs tailored to specific activities and site-specific biological resources, and ITP FEIR measures FP-02, FP-03, FP-04, FP-10, and FP-12, which will confine work areas, soil disturbance, and vegetation removal to the smallest area possible, while avoiding special habitat features to the extent possible. To minimize potential fire damage, spark arrestors will be used on equipment during fire season per FP-09. In addition, a 50-foot buffer will be placed around riparian habitat adjacent to work areas to further limit indirect impacts (FP-16, AMM Wetland-2). The project also will implement measures from the ITP to minimize spills and erosion, and restrict refueling near riparian areas (ITP 5.9, 5.10, 5.15, 7.1) (Table 5.4-11). Therefore, potential project impacts to riparian habitat or other sensitive natural communities will be less than significant. Project operation and maintenance will be conducted with existing staffing using existing access and no impact will occur.

c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? *Less-than-Significant Impact*.

Aquatic resources observed along the power lines mostly occur along access routes; however, several aquatic resources were identified adjacent to or within proposed work areas (Figure 5.4-4 and Appendix B2). The aquatic resource delineation identified five wetlands in the aquatic study and survey area comprising approximately 0.133 acre. In addition, 15 non-wetland water features (10 intermittent, 5 ephemeral) and 10 culverted waters were identified in the aquatic study and survey area. These features comprise approximately 0.357 acre (approximately 1,748 linear feet) of riverine-intermittent waters, approximately 0.029 acre (approximately 465 linear feet) of riverine-ephemeral waters, and approximately 1,514 linear feet of culverted waters.

The project has been designed to avoid impacts on waterways and all wetlands but one, and the project will not remove, fill, or result in the hydrologic interruption to waterways or wetlands since these will be flagged or fenced for avoidance in the field. A single shallow ephemeral drainage, Feature R-11 (Figure 5.4-4) may be temporarily affected by equipment movement in a work area, if not avoidable. Feature R-11 was classified as ephemeral flow regime and did not have a continuous surface connection to downstream traditional navigable waters, and does not meet the current definition of Waters of the U.S. The drainage is subject to disturbance during construction along 78 feet of its length, because it is located in a work area between two structures. This ephemeral drainage is approximately 2 feet wide, for a total potential impact of 156 square feet or 0.003 acres (refer to Figure 5.4-4). This area will be restored if damaged during construction. No other direct impacts to aquatic resources are expected to occur; therefore, the project is not expected to require permits under Sections 401 and 404 of the CWA.

Potential indirect adverse impacts to aquatic resources could occur if riparian vegetation adjacent to wetlands or streams is trimmed, or if hazardous materials (oils and fuels) or sediment-laden runoff are accidentally released into wetlands and streams. Vehicle and equipment access through wetlands also can impact wetlands. Impacts to wetlands and other aquatic resources will be minimized with implementation of the general measures from the BAHCP, ITP, and ITP FEIR described previously. Furthermore, the measures intended to provide protection for riparian areas, such as buffers, minimizing spills and erosion, and refueling restrictions, also will extend protection to aquatic resources (FP-15, FP-16, AMM Wetland-2; ITP 5.9, 5.10, 5.15, 7.1) (Tables 5.4-9, 5.4-10, 5.4-11). Therefore, potential project impacts to state or federally protected wetlands through direct removal, filling, hydrological interruption or other means will be less than significant.

Project operation and maintenance will be conducted with existing staffing using existing access and no impact will occur.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? *Less-than-Significant Impact*.

As described in previous sections for each species, some aquatic habitats in the vicinity of the project footprint have the potential to be used as breeding or nursery areas by CRLF, FYLF, and Northwestern pond turtle. Upland habitats may provide dispersal and movement habitat for CRLF and AWS, respectively, and BAHCP modeled habitats for both species have been mapped within and adjacent to the project footprint.

Wildlife may move through the BSA and use breeding habitat during work activities. Construction may temporarily impede wildlife movement and degrade breeding habitat or nursery sites within and adjacent to work areas. These potential impacts will be minimized with implementation of measures from the BAHCP, ITP, and ITP FEIR. Fenced work areas, per ITP 7.18 and ITP FEIR APM BIO-5 (Table 5.4-11, 5.4-12), will not impede special-status species or general wildlife movements between habitats given the amount of surrounding habitat and the limited size of each work area. Preconstruction surveys and monitoring during construction will be conducted for AWS as required by the ITP, as well as for CRLF, FYLF, and Northwestern pond turtle (MOX APM BIO-1, BIO-5, BIO-6) (Section 5.4.4.2.1). Individuals of listed species encountered in the work area will be allowed to leave unharmed and these encounters will be reported to PG&E in accordance with ITP FEIR APM BIO-2 (Table 5.4-12). With implementation of these measures, impacts are less than significant.

The eastern portion of the project footprint has been recognized as an important open space area and essential corridor/linkage by CDFW, the CEHC, and the Critical Linkage Project (refer to Figure 5.4-10). The CDFW Conservation Analysis Unit develops and maintains spatial data and models of wildlife movement, corridors, and habitat connectivity across California, to inform how best to conserve habitat connectivity, or the ability of species and ecological processes to move through the landscape. CDFW has compiled available regional linkage models along with California Essential Habitat Connectivity (CEHC) linkages developed at a statewide scale (Spencer et al. 2010), and other data sources (refer to Figure 5.4-10). The resulting Statewide Terrestrial Connectivity map , part of the CDFW Areas of Conservation Emphasis (ACE) project, presents a view of connectivity using the ACE hexagon grid, a statewide tessellation of 2.5 sq. mile hexagons. Each hexagon contains attributes identified across multiple studies and is then assigned to one of five ACE connectivity classes and accompanying ranks, indicating the relative importance of each area to providing opportunities for the movement and dispersal of organisms critical to maintaining healthy populations and species survival, with 5 being the most important and 1 the least. Most of the open space area east of Manzanita Drive to Moraga Substation is recognized as an important wildlife connectivity corridor. Because construction at any given location is short-term, and almost all impacts except for pole locations are temporary, with implementation of the measures discussed previously will limit impacts to all wildlife species using this area, and impacts are less than significant.

Migratory birds may move through the BSA during work activities and may nest in the vicinity. Construction activities may temporarily degrade nesting habitat within the immediate vicinity of the work locations; however, any potential effect is expected to be minimal based on the disturbed nature of many of the work locations and the large amount of surrounding habitat. BAHCP FP-18, ITP FEIR APM BIO-6, and MOX APM BIO-5 also will be implemented to reduce potential impacts to nesting birds below the level of significance (Tables 5.4-9, 5.4-12; Section 5.4.4.2.1).

Project operation and maintenance will be conducted with existing staffing using existing access and no impact will occur.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? Less-than-Significant Impact.

Although not subject to local regulations, PG&E strives to be consistent with local requirements for the protection of biological resources, where feasible, while remaining consistent with safety considerations.

The project will be consistent with County and City regulations regarding trees and riparian vegetation. Trimming or removal of protected or heritage trees may be necessary for construction access and will be conducted by a certified arborist in accordance with accepted arboricultural procedures to avoid impacting tree health or to make the decision to remove the tree if trimming is not feasible. Riparian vegetation will be avoided to the greatest extent feasible as described in response to c) above. In addition, measures from the BAHCP, ITP, and ITP FEIR will be implemented as part of the project. Therefore, potential impacts will be less than significant.

Project operation and maintenance will be conducted with existing staffing using existing access and no impact will occur.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? *No Impact*.

The project is located within the boundaries of the BAHCP and is a covered activity under the plan. Following construction, O&M activities associated with the project also will be covered under the BAHCP. The applicable BAHCP measures will be implemented during project construction (Tables 5.4-9, 5.4-10). Based on the project design, biological resources, BAHCP, ITP, and ITP FEIR measures, and project-specific APMs, the project activities and the proposed measures are consistent with and covered under the BAHCP, and will not conflict with the provisions of this or any other adopted plan. Therefore, there will be no impact.

Project operation and maintenance will be conducted with existing staffing using existing access and no impact will occur.

5.4.4.4 Additional CEQA Impact Question

g) Would the project create a substantial collision or electrocution risk for birds or bats? *Less-than-Significant Impact.*

During construction of the project, there is the potential for vehicle and equipment collisions with wildlife; however, PG&E will restrict vehicle and equipment use to designated work areas and approved access roads and will enforce speed limits for vehicles and equipment on the ROW and access roads in accordance with the general measures from the BAHCP, ITP, and ITP FEIR. There also is potential for avian interactions with PG&E power lines and structures, including collisions and electrocutions. Species of birds reported to be susceptible to collisions generally have a large body size, long wingspan, heavy body, and poor maneuverability. Collisions and electrocutions are known to occur more during spring and autumn migrations among medium- and large-sized birds (APLIC 2012). PG&E will minimize the potential for electrocution or accidental line collision by rebuilding the electrical lines in accordance with avian-safe construction standards and will implement the processes and procedures outlined in the PG&E Avian Protection Plan.

Conductors and ground wires will be spaced sufficiently apart so that raptors will not be electrocuted and all power line and substation facilities for the project will be designed to be avian safe, as appropriate and feasible, following the intent of Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006, 2012). Through project design, potential impacts will be less than significant, and potential impacts will be further minimized with implementation of the BAHCP, ITP, and ITP FEIR measures.

Project operation and maintenance will be conducted with existing staffing using existing access and no impact will occur.

5.5 Cultural Resources

This section describes existing conditions and potential impacts on cultural resources as a result of construction, operation, and maintenance of the project. It presents the methods and results of cultural resources studies of the project area. The analysis concludes that the proposed project will have a less than-significant impact on cultural resources. Incorporation of the APMs described in Section 3.5.4.2 will further minimize potential less-than-significant impacts on cultural resources. The project's potential effects on cultural resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.5-5 and discussed in more detail in Section 5.5.4. The following summary concerning cultural resources is derived from a Cultural Resources Identification and Evaluation Report completed in support of the project (refer to Appendix C). The assessment included a cultural resource records search, SLF search, literature review, pedestrian survey, Native American outreach, and a buried site sensitivity analysis. Refer to Appendix G for project correspondence with the Native American Heritage Commission and Native American tribes.

5.5.1 Methodology and Environmental Setting

Two APIs were identified, one for the archaeological analysis and one for the architectural analysis. Both APIs are located within the City of Orinda, unincorporated areas of Contra Costa County, and the Cities of Oakland and Piedmont within Alameda County. The project starts in the City of Orinda at Moraga Substation, with lines extending southwestward across hilly open space and park land in unincorporated Contra Costa County, including lands owned by EBRPD and EBMUD. This section of the project is referred to as the eastern section. The lines then continue southwestward into the central and western sections through residential, open space, and recreational use areas to Oakland X Substation in the City of Oakland, Alameda County. The APIs can be found on the USGS Oakland East 7.5-minute topographic quadrangle in Sections 8-11, 14-16, 21-22, and 28-32 of Township 1 south, Range 3 west of the Mount Diablo Base and Meridian.

The archaeological API is defined as all proposed locations of ground disturbance including laydown areas and staging areas, aboveground usage areas along the power lines, and access roads proposed as part of the project. It encompasses a 150-foot radius beyond all project elements and areas of ground disturbance. The entire archaeological API encompasses 636.98 acres, and the vertical limits extend up to approximately 30 feet below the existing ground surface for new structure foundations. Excavation for utility installation will extend up to approximately 13 feet below surface.

The architectural API encompasses areas in which potential physical, visual, atmospheric, or audible effects from the project could occur. The architectural API encompasses 633 acres, including areas related to the project's construction, implementation, and operation. The architectural API includes parcels that intersect with project activities and adjacent parcels where visual impacts are possible. Because the use of staging areas (which include existing paved lots, existing graded or gravel lots, and portions of existing paved streets) and access roads will not result in changes that will impact historic resources, these are not included in the API. The vertical extent of the architectural API does not exceed 168 feet above the existing ground surface for the replacement line structures and 30 feet above the existing ground surface for the substations' improvements. The visibility of the lines was field verified in the eastern and central sections of the project, where the structures and conductors will be replaced aboveground. Detail of the architectural API is included in Appendix C, Appendix A, Figure 2.

Extensive background research was completed in support of the archaeology and architectural studies and included a records search, SLF search, Native American outreach, archival research, and a buried site sensitivity analysis. Background research included searches of PG&E's Confidential Cultural Resource Database (CCRD), the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Inventory of Historic Resources, California Points of Historic Interest, California Historical Landmarks, California Department of Transportation Bridge Inventory, and Historic Properties Directory. In addition, historical maps and aerial photographs were reviewed, in particular, the USGS repository; David Rumsey Map Collection; ProQuest Sanborn Fire Insurance Maps Collection;

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

National Environmental Title Research; and the University of California, Berkeley, Earth Sciences and Map Library historical topographic map collections. The records search included a 0.25-mile buffer around the archaeological API and the architectural API.

Additional background research to identify architectural resources within the architectural API and develop a historic context included review of primary and secondary sources available at repositories and online, such as maps, aerial images, regional histories, and historic newspapers. Statewide historic contexts pertinent to the architectural API also were reviewed. Repositories and information sources consulted include the following:

- Alameda and Contra Costa County libraries
- Alameda and Contra Costa County Historical Society Historical Societies
- Oakland Museum of California
- Orinda Historical Society
- Moraga History Center
- National Park Service
- Ancestry.com
- ChroniclingAmerica.loc.gov (Library of Congress historic newspaper database)
- General Land Office land records
- National Archives
- Newspapers.com
- NewspaperArchive.com
- National Register Focus Database
- ParcelQuest
- USGS topographic maps
- U.S. Census Records

5.5.1.1 Cultural Resources Summary

Cultural resources are summarized by precontact, ethnographic context, and historical research, including architectural resources or built environment.

Precontact Context

Early archaeological investigations in the Bay Area were conducted by Nels Nelson in 1907 and 1908 and resulted in the identification of over 400 "shell heaps, earth mounds, and a few minor localities that cannot be termed anything but temporary camp sites" (Nelson 1909). Nelson recorded more than 100 shellmounds along the bay shore of Alameda and Contra Costa Counties, including some of the most important sites in central California, and mapped 18 sites in San Francisco County. Three sites in the northeast bay provided the basis for the initial study of cultural change in central California. These sites include the Emeryville shellmound (CA-ALA-309) in Alameda County and two sites in Contra Costa County, the Ellis Landing site (CA-CCO-295) and the Fernandez site (CA-CCO-259), which is slightly inland in Rodeo Valley.

During the early 1900s, Llewellyn L. Loud described and mapped the remains of a dozen mounds at the north end of the Santa Clara Valley (Loud 1912). Many of the mounds were within the Rancho Posolmi and had already been disturbed or demolished by farming activities or construction. Loud's excavations at CA-SCL-1, often referred to as the Castro Mound or Ponce site (Heizer and Beardsley 1954; Beardsley 1954; Moratto 2004), were among the earliest and most extensive near the project. Among the cultural remains documented in the large mound midden were 2 house floors and 61 burials, many with mortuary items. Compared to other Bay Area mounds from the same period, Loud noted a difference in the number and type of shellfish remains in the assemblages from the South Bay sites (Loud 1912).

The studies in the Bay Area conducted in the early 1900s on the northern, eastern, and southern bay shores formed the basis for an initial study of cultural change in the Bay Area and the Sacramento–San Joaquin Delta and led to the later development of the Central California Taxonomic System (CCTS).

The CCTS is the result of efforts of numerous researchers (for example, Beardsley 1948; Heizer and Beardsley 1954; Heizer 1949) and has been further refined over the succeeding decades. The tripartite CCTS classification scheme defines three temporal periods (Early, Middle, and Late) that are marked by changes in distinct artifact types, subsistence orientation, and settlement patterns. The generalized periods are associated with regionally based cultural patterns (Bennyhoff et al. 1994; Fredrickson 1973; 1974; Wallace 1955, 1978). The periods of Bay Area prehistory are summarized in Table 5.5-1 and are further described in the following subsections.

Table 5.5-1. Chronology and Regional Cultural Patterns in Bay Area Prehistory

Period	Cultural Pattern	Timeframe
Early Period	Millingstone Pattern	11,000–5500 years before present (B.P.)
	Windmiller Pattern[a]	5500–2500 B.P.
Middle Period	Berkeley Pattern	2500–1000 B.P.
Late Period	Augustine Pattern	1000 B.P. to Historic Contact

[a] The presence of the Windmiller Pattern during the Early Period in the Bay Area is controversial (for example, Bennyhoff et al. 1994; Gerow and Force 1968; Gerow 1974; Heizer 1949; Moratto 2004) and may be referred to elsewhere as the Lower Berkeley Pattern (for example, Milliken et al. 2007).

Early Period (11,000–5,500 B.P.)

There is limited archaeological evidence of occupation in the Bay Area dating earlier than 6,000 years ago during the Early Holocene when sea levels were dramatically lower than today. It is likely that sea-level rise and Holocene alluvial deposits, which are up to 33 feet (10 meters) thick in some locations around the Bay region, buried many prehistoric sites in this area (Meyer 2004; Moratto 2004; Ragir 1972). One of the oldest cultural deposits in the Bay Area is in the Coyote Narrows at the Metcalf Road/US 101 overcrossing at Tulare Hill. The Metcalf site (CA-SCL-178) was discovered 3.3 meters below the surface in a buried soil at the mouth of Metcalf Creek and the earliest occupation layer dates to 11,050–9,475 cal B.P. (Meyer and Rosenthal 2007). At another Bay Area millingstone site (CA-SCL-65), two flexed burials were found beneath cairns of millingstones dating between 7,500 and 7,000 years ago (Fitzgerald 1993). Along with the Sand Hill Bluff shellmound on the peninsula coast of Santa Cruz County (CA-SCR-7), the artifact assemblages in these Millingstone Pattern sites include large numbers of handstones and milling slabs, as well as core and flake tools (Hylkema 2002:233–235).

Windmiller Pattern sites in the Sacramento Valley and Sacramento–San Joaquin Delta often contain manos and metates (grinding stones), as well as many mortar fragments, large obsidian concave base and stemmed projectile points, rectangular Olivella beads, perforated and phallic charmstones, ventrally extended burials, and a westerly orientation of graves. Artifact assemblages from the South Bay peninsula, such as from CA-SCL-354 in the Los Altos foothills, including Olivella rectangular beads (type L1) and Rossi square-stemmed and large side-notched projectile points, imply that characteristics of Windmiller assemblages were present (Hylkema 2002:244, 250). Moratto (2004) suggests that migrations into the Bay-Delta Region around 4,500 B.P. may have introduced the Windmiller Pattern, displacing earlier Hokan speaking inhabitants. The Windmiller migration hypothesis finds some support from strontium isotope analysis of human remains recovered from the Marsh Creek Site (CA-CCO-548) in Brentwood, Contra Costa County (Byrd et al. 2017; Jorgenson et al. 2009).

Middle Period (2,500–1,000 B.P.)

The Berkeley Pattern is found throughout the Bay region during the Late Holocene. The earliest assemblages attributable to this pattern are coeval with the Windmiller Pattern, including the lower levels of the West Berkeley site (CA-ALA-307) in Alameda County and the University Village site (CA-SMA-77) in San Mateo County (Elsasser 1978; Wallace and Lathrop 1975). Artifacts typical of the Berkeley Pattern include spire-lopped (Types A1a and A1b) Olivella shell beads, bone tubes and beads, bird-bone whistles, quartz crystals, serrated mammal scapulas, and ground bone awls (Elsasser 1978; Moratto 2004; Bennyhoff and Hughes 1987). Projectile points are commonly contracting stemmed and lanceolate types, some of which are made from obsidian (Hylkema 2002). Burials are variable flexed and semi-flexed with inconsistent orientation; there is an increase in mortuary items, particularly during the late Middle Period, compared to few mortuary items identified during the Early Period in Bay Area sites.

Milling implements include large and small boulder or cobble mortars and various types of pestles, suggesting small seeds or acorns formed an important part of the diet. In the South Bay, processing of hard seeds continued to be important throughout this period, as evidenced by the number of milling slabs and handstones in the artifact assemblages from this area (Hylkema 2002). Other plant resources included hazel nuts, cattail seeds, grass, and soaproot bulbs; the latter were roasted in earth ovens. Faunal analyses indicate the diet during this period was rich and varied, with a variety of small and large mammals, fish, and birds, as well as mussel, oyster, and clam.

Shellfish species exploited varied depending on location within the Bay Area (Hylkema 2002). Along the West Bay in San Mateo County and the East Bay of Alameda County, bay mussels, oysters, and clams are more prevalent. In contrast, horn snails, oysters, and bay mussels are the principal shellfish recovered from South Bay mounds. Large accumulations of shellfish remains or "shellmounds" formed over hundreds, or even thousands, of years through accretion at village sites fronting the Bay that were reused seasonally or year-round (Lightfoot 1997). Numerous shellmounds contain hundreds of burials as well as ceremonial items, house floors, hearths, and storage pits, indicating they were used as burial, ceremonial, and residential places (Lightfoot 1997; Lightfoot and Luby 2002).

The well-known Emeryville shellmound (CA-ALA-309) and Ellis Landing site (CA-CCO-295) also date to this period. Within the current project area and the former Rancho Posolmi, radiocarbon dates obtained from excavations conducted in 2008 in the mound initially recorded in 1912 by Loud indicate CA-SCL-12/H was occupied throughout the late Early Period and Middle Period (3,300–2,400 B.P.) with some evidence of Late to Historic Period occupation (Byrd and Berg 2009; Loud 1912). During recent excavations, a variety of cultural materials, including lithic flakes and tools, shellfish, faunal bone, and human remains, were recovered from intact occupation components at depths up to 1.8 meters below the surface. CA-SCL-12/H also included the gravesite of Lope Yñigo, who is among the few Native Americans awarded Mexican land grants (Byrd and Berg 2009; Shoup and Milliken 1999).

Late Period (1,000 B.P. to Historic Contact)

In the Bay Area, the Augustine Pattern follows the "golden age of shell mound communities" of the Berkeley Pattern (Lightfoot and Luby 2002). Numerous changes in subsistence, foraging, and land use patterns that begin to reflect the use pattern known from Historic Period Native American groups in the area is evident. The pattern is identified by the introduction of bow and arrow technology, the use of harpoons, and tubular tobacco pipes. An increase in the intensity of subsistence exploitation correlates directly with population growth, and greater emphasis is placed on the procurement and processing of vegetal foods, especially acorns, as evidenced in the increase of milling tools, especially the mortar and pestle (Moratto 2004). Coiled and twined basketry were used as domestic and ceremonial items.

Population size and the number of settlements increased during this period, although the large shellmound villages of the Berkeley Pattern were apparently no longer favored residential places and many were abandoned (Lightfoot and Luby 2002). The dry conditions during the Medieval Climatic Anomaly, which produced droughts across the west between about A.D. 650 to 850 and A.D. 1150 to 1250 (Jones et al. 1999) may be related to the abandonment of shellmound villages as primary residential locations (Lightfoot and Luby 2002). Settlement strategies were apparently reorganized and focused on a dispersed pattern, with the establishment of coastal and interior habitation areas, coinciding with the exploitation of seasonally available resources.

The Augustine Pattern ushers in a time of status differentiation and the rise of secret societies and cults and associated traits. Exchange networks, with the use of clamshell disk beads as a form of currency, expanded during this period. Exchange items included magnesite, steatite, Olivella beads, and obsidian. Compared to the Middle Period, the use and occurrence of shell beads with burials blossomed (Bennyhoff and Milliken 1993; Milliken et al. 2007). Haliotis banjo pendants may represent the introduction and spread of the Kuksu cult, beginning during the transition from the Middle to Late Period in the Bay Area (Hylkema 2002). The magnitude of non-dietary Olivella shells in coastal sites during the Late Period, coupled with a concomitant increase of the shells in mortuary contexts throughout central California during this period, attests to the rise of exchange networks and status differentiation, with coastal peoples supplying the shells to the interior groups.

Ethnographic Context

The project is at the interface of the Ohlone (also known as Costanoan) and Bay Miwok ethnographic territories, with the Ohlone occupying lands on the western side of the project area and the Bay Miwok occupying those on the eastern side. Ethnographic contexts for each are provided as follows.

Ohlone (Costanoan)

The western portion of the project area is within the ethnographic territory of the Ohlone, or Costanoan tribe. Specifically, the project is on lands occupied by the Huchiun subgroup of Costanoans, in the Huchiun-Southern tribal region, which is estimated to have supported a population of 360 individuals at the time of the first European contact (Byrd et al. 2017; Levy 1978a; Milliken 1995). Despite a history of devastation and displacement brought about by exposure to nonlocal diseases and impositions of the Spanish mission system followed by non-native settlers (for example, Milliken 1995), Ohlone people continue to live in their traditional territory within Contra Costa and Alameda counties and continue traditional cultural practices. Some participate in local planning and development projects as consultants and construction monitors to oversee treatment of their cultural heritage and resources of cultural and sacred importance.

What we know of the traditional Ohlone way of life has been transmitted through written records from early European contact of explorers and trappers, from the Spanish mission system written records, and from studies by non-native scholars who wrote about Ohlone peoples. Linguistic and archaeological findings have provided some information as well. The following brief description is based on Levy (1978a), Harrington (1942), Kroeber (1925), Lightfoot and Parrish (2009), Milliken (1995a), and Heizer and Elsasser (1980), and is meant as an introduction, rather than an exhaustive description of Ohlone culture.

Approximately 40 tribelets, each made up of multiple villages, were noted at the time of contact in the 18th century. Each tribelet was led by a chief and council of elders. Each village was composed of an amalgam of family households. Households were made up of about 15 people, and social organization was patrilineal. Tribelets had complex interactions with one another (Milliken 1995). Religious culture involved prayer and the offering of valuables, such as beads, headdresses, tobacco, and other goods, while shamanic leaders mediated between the tribes and supernatural powers in more direct ways (Levy 1978a). Important parallels can be drawn between the mythologies of the Ohlone and those of the Coast Miwok, Pomos, Wappos, and Patwins (Milliken et al. 2009). The mythological tradition of the Ohlone centralized Coyote who created the world, received the prayers of tribal members, and guided them in the afterlife. The Bay Area landscape for example was imbued with religious meaning, "so that myth and ceremony became a unique constitution for local sovereignty… [and] each tribe might be thought of as an independent, landholding religious congregation" (Milliken 1995:13).

Acorns were a dietary staple supplemented by a wide variety of other nuts, seeds, tubers, berries, herbs, fish, and animal resources. Acorns were ground into flour with mortar and pestle the nut was made into bread and other dishes. In addition to the deer, rabbits, and fish available in the area today, other large herbivores, including elk and pronghorn antelope, were exploited in the past. Marine resources, such as Olympia oyster (*Ostrea lurida*), California mussel (*Mytilus californianus*), and waterfowl, also represented a large portion of the Ohlone diet. Horned sea snails were harvested in significant numbers by the Ohlone tribes during the Late Period (Milliken et al. 2007). The Ohlone supplemented these primary foods with resources acquired through extensive trade networks with the Plains and Sierra Miwok, Patwins, Yokuts, and others. Controlled burning of local land was conducted in the fall to ensure a healthy supply of plant foods each year (Levy 1978a).

Ohlone used laurel branches, tule, grass, willow boughs, and ferns to make thatched and domed shelters. Other structures included sweathouses that were dug into creek banks and circular dance floors. Woven baskets had many uses, including storage, cooking, acorn preparation, and fish traps. Baskets and articles of personal adornment were detailed with feathers, shell beads, and other items including mica and ocher. Local rock was used to line fire pits and to form hand tools, such as pestles for grinding. Locally available rock, such as chert, was struck to form sharp-edge tools like scrapers and knives and was supplemented by imported obsidian, which was obtained through trade and exchange.

Significant technological distinctions are evident in the material culture of the Ohlone of the San Francisco Bay Area and those inhabiting the region of Monterey; lithic tool type differences offering the most abundant examples (Milliken et al. 2009). Numerous ornamental feathered items were produced for ceremonial performances and other secular uses, including robes, staffs, and weaponry (Kelly 1976). Canoes or balsas made of tule were constructed and used for navigation through marshland channels, promoting trade and productive hunting and fishing; while coiled and twined basketry occasionally ornamented with feathers and beads facilitated Ohlone life in the form of food storage containers, cradles, cooking implements, and myriad other crafts. Production and labor tasks were divided along gender lines with women being responsible for the harvesting of vegetal resources and basket weaving, and men for the bulk of the hunting, fishing, and the construction and placement of traps for wild game (Milliken 1995; Milliken et al. 2009).

The Ohlone first encountered Spanish explorers in 1602 when Sebastián Vizcaíno came to shore in Monterey. The earliest documented encounters between the San Francisco Bay region Ohlone and the Spanish take place during the Portolá Expedition of 1769 and continue with the intrusion of later explorers Fages (1770), Anza (1774, 1776), Rivera (1774), and Moraga (1776). While these initial interactions were likely brief, contact between indigenous tribes and the Spanish would become lasting and profoundly consequential with the institution of the California mission system. Between the arrival of Portolá and company and the year 1797, seven Catholic Missions were established in territory occupied by Ohlone tribes, including in San Francisco, San Jose, and Santa Clara. By 1810, most indigenous people in the Bay Area had been absorbed into the Missions, which required the large-scale abandonment of their traditional lifeways. For the Ohlone, the combined effect of a marked reduction in birth rate and the introduction of diseases against which indigenous Californians had little defense was a dramatic drop in population size. Ohlone populations fell 80 percent from an estimated 10,000 people in 1770, to 2,000 by 1832 (Cook 1943; Levy 1978a).

During the mission period indigenous Northern California tribes from numerous linguistic and cultural backgrounds were brought together under the control of the Catholic Church. In the process, separations occurred between related groups, with individuals from particular tribal bands often being sent to different work camps and Missions. This abrupt tribal fracturing and concurrent intertribal mélange coalesced to make the retention of traditional and distinct indigenous subcultures practically impossible. As subsequent generations were born into the established colonial institutions, separations and dislocations were exacerbated. By the time the California mission system was being dismantled in 1834, only 37 of the 190 Native Americans registered at Mission Dolores for example were identified as descendants of the San Francisco Peninsula Ohlone. Nevertheless, thousands of indigenous people today trace their ancestry back to speakers of languages within the same family as San Francisco Bay Costanoan (Milliken et al. 2009).

Bay Miwok

The eastern side of the project area is in the ethnographic territory of the Bay Miwok (also spelled Mi-wuk) who occupied the eastern portion of Contra Costa County near Mount Diablo, from Walnut Creek in the west, to the Sacramento–San Joaquin Delta in the east. They are one of five Eastern Miwok tribes (Bay, Plains, Northern Sierra, Central Sierra, and Southern Sierra) whose Eastern Miwok language derives from the Miwokan branch of the Utian language family, a subgroup of Penutian linguistic group. Specifically, the eastern portion of the project was occupied by the Saclan subgroup, constituted of roughly 250 individuals at the time of European contact (Byrd et al. 2017). Neighboring groups included the Ohlone to the southwest, the Northern Valley Yokuts to the southeast, the Plains Miwok to the east, and the Patwin to the north (Byrd et al. 2017; Kroeber 1925; Levy 1978b).

The Eastern Miwok relied primarily on gathering wild foods and hunting mammals for subsistence. They practiced controlled burning to ensure ample forage for mule deer, tule elk, and antelope, which they hunted. Among the plant foods exploited were greens collected in the spring and acorns collected in the fall. Acorns were of particular importance to the diet, and seven varieties were used. Nuts collected included buckeye (*Aesculus californica*), laurel (*Umbellularia californica*), hazelnut (*Corylus cornuta* var. *californica*), digger pine (*Pinus sabiniana*), and sugar pine (*Pinus lambertiana*). Oak trees from which this staple food was gathered annually were carefully preserved by the Eastern Miwok (Levy 1978b; Heizer and Elsasser 1980). Rabbit, salmon, valley quail, gray pine nuts, blue oak acorns, and live oak acorns were obtained in the foothills and shellfish, including California mussel (*Mytilus californianus*), Olympia oyster (*Ostrea lurida*), and bent-nose clam (*Macoma nasuta*) were collected from the Bay estuary.

Political units among the Miwok were structured by similarities in language and ethnicity, and villages were divided into "tribelets" (Levy 1978b). Tribelets controlled specific lands and the natural resources within that territory. The population size of one Bay Miwok tribelet, probably the Chupcan, was estimated to be around 400 by Juan Bautista de Anza while on an expedition in the Antioch area on April 3, 1776. The total population size of the Bay Miwok at the time of contact may have been around 1,700 (Levy 1978b). The tribelet was the main political unit of all Eastern Miwok tribes. Each tribelet was an independent and sovereign population with a defined and bounded territory and control of the resources of that territory. Typically, several campsites were within that territory for use at various times during the hunting and gathering season. The main house type in Bay Miwok territory was a thatched structure with a conical framework and a thatch of brush, grass, or tules attached to the top. Villages contained acorn granaries, winter grinding houses, and conical sweathouses (Levy 1978b).

Similar to other California Native American groups, the Eastern Miwok employed a variety of tools, implements, and enclosures for hunting and collecting natural resources. The bow and arrow, snares, traps, nets, and enclosures or blinds were used for hunting land mammals and birds. For fishing, they made canoes from tule, balsa, or logs, and used harpoons, hooks, nets, and basketry traps. To collect plant resources, they used sharpened digging sticks, long poles for dislodging acorns and pinecones, and a variety of woven tools (seed beaters, burden baskets, and carrying nets; Levy 1978b).

Foods were processed with a variety of tools, such as bedrock mortars, cobblestone pestles, anvils, and portable stone or wooden mortars that were used to grind or mill acorns and seeds. Additional tools and implements included knives, anvils, leaching baskets and bowls, woven parching trays, and woven strainers and winnowers. Prior to processing, the acorns were stored in the village granaries. The Eastern Miwok used earth ovens to bake acorn bread. The Miwok participated in an extensive east-west trade network between the coast and the Great Basin. From coastal groups marine shell (*Olivella* and abalone) and steatite moved eastward, while salt and obsidian traveled westward from the Sierras and Great Basin. Basketry, an important trade item, moved eastward and westward (Levy 1978b).

The Bay Miwok was the earliest of the Eastern Miwok groups to be missionized, with the first neophytes arriving at Mission San Francisco in 1794. Numerous Bay and Plains Miwok tribelets died or relocated as a result of encroachment, conversion, and epidemic disease. The discovery in 1848 of gold in the western Sierra Nevada foothills and the ensuing Gold Rush led to a flood of non-indigenous peoples into Miwok territory. Their reliance on cash income increased as the availability of natural resources declined with the growth of non-Miwokan communities and towns in their traditional territory (Levy 1978b).

During the first half of the 1900s, the federal government acquired lands and established reservations, or *rancherias*, for the Eastern Miwok (Levy 1978b). The U.S. Bureau of Indian Affairs terminated relations with most of these rancherias between 1934 and 1972, but status has been restored to the majority of the rancherias, beginning in 1984. No reservations were established in Southern Miwok territory, and the tribe did not receive official recognition by the federal government. At present, there are seven federally recognized rancherias (Wilton, Shingle Springs, Jackson, Buena Vista, Sheep Ranch, Tuolumne, and Chicken Ranch) in Amador, Calaveras, El Dorado, Lake, and Tuolumne counties that have primarily or exclusively Eastern Miwok populations (BIA 2015).

Historic Context

The following historic context is focused on the built environment within the study area (0.25 mile radius from the API), with an emphasis on development related to identified historic resource types that were surveyed and evaluated for this project. The built environment context begins with Oakland's early development, power infrastructure, and residential growth within the study area and surrounding communities, such as Oakland Hills and Moraga.

Oakland's Early Residential and Industrial Growth

In 1770, Spanish explorer Pedro Fages became the first Euro-American explorer to contact the East Bay area of northern California after he forged an overland route from Monterey in the south. He returned via the naval entrance of the San Francisco Bay in 1772. Fage's explorations informed Juan Bautista de Anza's 1776 venture to establish a northern mission and Presidio (Beck and Haase 1974; Hayes 2007). Shortly after de Anza's voyage concluded, party member Gabriel Peralta returned to the area with his young family and established a cattle operation at the 44,800-acre Rancho San Antonio. In 1848, James W. Marshall found gold in the American River near Coloma, California. Within several months, thousands of gold seekers entered California via the San Francisco Bay and traveled through the Oakland area on the way to the Sierra Nevada gold fields. Along the way, travelers squatted on rancho properties, including Rancho San Antonio, to steal food, cattle, and supplies from the landowners (Gebhard and Winter 1985). In 1852, Peralta begrudgingly reached a land-sharing agreement with three interlopers who had filed land claims on his property. The squatters – Horace Carpentier, Edson Adams, and Andrew Moon – quickly broke the agreement when they hired Julius Kellersberger to plat a town on the east bank of the San Francisco Bay (Patron 2015; Gebhard and Winter 1985).

On May 4, 1852, Carpentier submitted Kellersberger's city plan using the name "City of Oakland." As the California State Legislature debated Oakland's future over the next 2 years, Carpentier made a series of financial deals to acquire the entirety of Oakland's waterfront. With a monopoly over the waterfront, Carpentier established the only private passenger and freight ferry system to run between Oakland and San Francisco. The loss of prime industrial and commercial space stifled the city's growth in the first two decades of its existence (Hoover 2002; Walker 2005).

By the late 1860s, Oakland had just over 10,000 residents and 16 businesses comprised the economy, including sawmills, tanneries, slaughterhouses, dairies, a jute paper mill, flour mill, drydocks, a brewery, and cobbler's shoe and boot-repair shop. The City of Oakland filed an order to reclaim the waterfront in 1868, but, before any litigation occurred, Carpentier sold the land to the Central Pacific Railroad. In a quick turn of fortune for the city, the Central Pacific Railroad developed the area as the western terminus of the Transcontinental Railroad, which was completed in 1869. The development of the Central Pacific Railroad's Transcontinental terminus led to the first substantial population and industry boom in Oakland and surrounding East Bay communities. By 1875, the area's population had grown to 15,000 residents and several small, localized utility companies began providing scattered electric and water service. Over the next 15 years, an additional 42,000 residents would settle in Oakland and its surrounding communities, contributing to the rapid urbanization of the region (Hoover 2002; Walker 2005).

Power Infrastructure

By the end of the nineteenth century, East Bay area utility companies had constructed a tangled network of power and water infrastructure. Firms used a patchwork of rudimentary hydroelectric and transmissions systems that provided reliable service to the East Bay's 47,000 residents. As California's population continued to grow into the early years of the twentieth century, two large companies emerged as leaders in infrastructure development. In 1905, San Francisco Gas Company and California Electric Light Company merged to form PG&E. A year later, the Great Western Power Company incorporated. Just as the two rivals emerged, the Great San Francisco Earthquake rocked the area in 1906. Tens of thousands of disaster refugees relocated from San Francisco to Oakland and, by 1910, 150,000 people lived in the East Bay. PG&E responded to the disaster, and power shortage, by purchasing small firms and incorporating their systems into larger networks. The Great Western Power Company invested in new infrastructure and substations, including Oakland X Substation (formerly named the 37th Street Substation [Resource Identifier (ID) 1) (Walker 2005; Sanborn Fire Insurance Co. 1912).

Oakland X Substation, which cost $49,000 to construct, was connected to the electric grid in 1908. By 1909, the Great Western Power Company contracted the Thompson, Garratt Construction Company to double the size of the substation for an additional $45,000 (Oakland Tribune 1909). Between 1910 and 1920, both large utility companies established long-distance electric power lines as electricity demand increased. As new construction mounted, PG&E continued to purchase dozens of geographically focused utilities and, by 1925, endeavored to purchase its largest competitor, Great Western Power Company. In 1930, PG&E succeeded and purchased the Great Western Power Company, forming a utility monopoly across northern California (Walker 2005).

PG&E projected that the area load demand would double in the decade between 1945 and 1955 (Walker 2005). To address this growing demand for energy at the mid-century, PG&E announced a $370 million construction program to expand electricity and natural gas services in northern and central California (Oakland Tribune1947). PG&E's investment was desperately needed in the East Bay area, which had only continued to grow. Moraga Substation (Resource ID 79) was constructed between 1946 and 1948 to provide energy to the East Bay area's swelling population. The substation originally included a utilitarian control building and industrial components, including a maintenance garage and switchyard. The substation was also developed with an Italianate-inspired transformer-handling house. The transformer-handling house somewhat mitigated the perceived unpleasant visual impacts of an industrial property in an otherwise upscale residential neighborhood. The Moraga Substation transformer-handling house was among PG&E's final attempts to construct substation grounds with enhanced designs complimenting the area's natural environment. In the 1950s, PG&E transitioned to building utilitarian structures with industrial, modern facades constructed with mass-produced materials (Baker 2011).

Historic aerials indicate that the Oakland-Moraga High Voltage Transmission Line (Resource ID 2) has undergone routine maintenance between its initial construction and 2020. In 2024, Oakland X Substation serves customers in Oakland, Piedmont, Berkeley, Emeryville, Alameda, and unincorporated Contra Costa County.

Residential Growth

In 1871, the area now developed with the west half of the architectural API was a grassy recreation area called "Lake Park." In the 1880s, the area belonged to San Francisco banker Peder Sather. After his death in 1886, his widow reopened the land to the public. In 1893, Francis Marion "Borax" Smith's Oakland Traction Company extended a trolley line from downtown Oakland to the intersection of Grosvenor Place and Holman Road via Park Boulevard. From there, the railcars would use a large, wooden trestle that spanned Indian Gulch, before depositing their passengers in the park. Although the trestle was demolished in 1906, residents continued to call the area "Trestle Glen" (Lakeshore Homes Association 2024).

In 1915, Wickham Havens and Walter H. Leimert purchased the Trestle Glen land tract for a planned, residential subdevelopment. Havens and Leimert employed the Olmsted Brothers (whose father was Frederick Law Olmsted) to design Trestle Glen (located within the architectural API) as an upper-income residential subdevelopment inspired by England's "garden suburbs." The neighborhood was built with winding streets, preserved natural areas, and spacious residential lots with large houses. To assure Trestle Glen's exclusivity, Havens and Leimert established the Lakeshore Homeowners Association (established in 1917), the second oldest homeowners' association west of the Mississippi River, to review potential homeowners (Lakeshore Homeowners Association 2024).

The developers considered the homeowners' association necessary because, as neighborhood planning occurred, multiple population shifts surged through the East Bay area. Between 1914 and 1918. industrial development, spurred by World War I, and Progressive-era programs, including improved transportation infrastructure, sanitation, city streets, and protected parkland, attracted new residents. As the East Bay's racial makeup evolved, the Lakeshore Homes Association enacted racial covenants and exclusionary sales tactics to exclude individuals and families of color (racial covenants were stricken from neighborhood bylaws in 1979) (Mailman 2005; Whiting 2004; Bagwell 1982).

The Lakeshore Homeowners Association invited "desirable individuals" to tour Trestle Glen and 10 standardized model residences with Italianate, Tudor, Spanish, Monterey, French Provincial and Normandy, Colonial, Craftsman, and Mediterranean architectural styles. Each house was staffed by a hostess who would emphasize the exclusivity of the neighborhood and demonstrate the wonders of all-electric appliances, which came preinstalled in each house. Approved buyers would purchase a parcel and choose among 1 of the 10 floorplans, which was then constructed. Residences within Trestle Glen were largely constructed in the late 1910s and throughout the 1920s. Real estate developers seized upon the immediate success of Trestle Glen and began to subdivide residential communities in Oakland Hills (Whiting 2004).

After the successful introduction of Trestle Glen, Leimert established the equally prosperous Oakmore Highlands, Lakeshore Heights, and Dimond Canyon subdivisions along either side of Park Boulevard. With each new development, Oakland's boundaries expanded eastward and into the hills above the central city. To accommodate growing utility demand, EBMUD incorporated and began providing wastewater services. By 1930, Oakland neighborhoods had begun to encroach upon the towns of San Leandro, Berkeley, Alameda, and Emeryville. Although expansion stalled at the onset of the Great Depression in 1929, construction resumed by 1933. In 1935, the East Bay Street Railway, Ltd. added a new route that connected the Piedmont Pines station to communities in Oakland Hills. In 1936, the East Bay Sibley Volcanic Regional Preserve was founded and placed under the administrative purview of EBMUD. At first, urban residents used the railway to access the parkland. Then, in 1937, the Caldecott Tunnel opened to facilitate travel between Oakland, Sibley Volcanic Regional Preserve, and the small, inland communities in Contra Costa County (Whiting 2004).

Although the new Caldecott Tunnel route precipitated a small rise in home construction in the burgeoning communities of Orinda, Glorietta, Lost Valley, and Moraga, the conclusion of World War II instigated the region's first population boom. After the war, and during the resulting baby boom, urban residents used the improved transportation between Contra Costa and Alameda Counties to move east. By the late 1940s and early 1950s, sprawling residential neighborhoods developed with ranch-style residences ubiquitous across the region. Simultaneously, personal motor vehicles grew in popularity, and the public's use of electric trams diminished. By the mid- to late-1950s, the streetcar lines that had instigated the East Bay's residential expansion had been converted for street lighting (Whiting 2004).

Although historical aerials and maps indicate that development in the architectural API has been largely stagnant since the mid-20th century, a new road was constructed through the Trestle Glen neighborhood in the late 1950s and early 1960s. A total of 160 residences were demolished to make way for the road (Lakeshore Homes Association 2024). Orinda (east end of architectural API) was formally incorporated as a city in 1985 (NETR 2024; Whiting 2004; Orinda Historical Society 2024).

5.5.1.2 Record Search Results

A search of PG&E's CCRD was conducted in November 2023. The CCRD includes PG&E's in-house records and California Historical Resources Information System records on file at the Northwest Information Center, Sonoma State University in Rohnert Park. The records search covered a study area defined as a 0.25-mile buffer radius on the archaeological API, which encompasses the entire architectural API.

The CCRD search indicates that 109 cultural resource investigations have been previously conducted within 0.25 mile of the project area (Table 5.5-2). Twenty-two of these past investigations are regional or thematic studies that did not include focused survey. Of the 87 remaining cultural resource studies, 59 included survey or other focused investigation of portions of the project alignment, covering approximately 60 percent of the total project area. They were completed between 1974 and 2023.

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
Focused Studies within the API			
08160518	Cultural Resources Constraints Report: Bahia-Moraga 230kV Vegetation Management	2014	Martin, Heather Darren Andolina
30950935	Cultural Resources Constraints Report; Aldyl-A Rincon and Magellan, Oakland, Alameda County, PM 30950935	2013	Cox, Beatrice Matthew A. Russell
30968149	Cultural Resources Constraints Report; GPRP St. James Place, Piedmont, Alameda County, PM 30968149	2013	Russell, Matthew A. Beatrice Cox
30968150	Cultural Resources Constraints Report: GPRP Glenfield Avenue, Oakland, Alameda County, California	2014	Russel, Matthew A.
31079282	Cultural Resources Constraints Report; Oakland 1104 - Oakland Removal of Idle Facilities, Contra Costa County, PM 31079282	2014	Schrader, Lucian N. III
31130849	Cultural Resources Constraints Report Tear Sheet for Moraga 1105 - Pole & Anchor Replacement, Contra Costa (PM 31130849)	2015	Schwennesen, Tad
31783075	Cultural Resources Constraints Report: Moraga-Oakland Tower and Road Repair (PM: 31783075)	2013	Hallock, Ashley
Baker_2011	California Register of Historic Places Evaluation, Moraga Substation and the Contra Costa-Moraga Transmission Line, Contra Costa County, California	2011	Baker, Cindy L.
Contra Costa 1976	Preliminary Historic Resources Inventory, Contra Costa County, California 1976	1976	Contra Costa County Planning Department
Corbelt 1993	Control Building Study Project	1993	Corbelt, Michael
Cox 2017	Cultural Resources Constraints Report; TSP Tower Replacement, Oakland, Alameda County (Circuit No. Moraga-Oakland Nos. 1, 2, 3 and 4 115 kV); PM 74008842	2017	Cox, Beatrice
Crumpton 2018	Cultural Resources Constraints Report; Moraga-Oakland #1, #2, #3, #4 115kV TVMR Non-Riparian 2018; PM 8101016	2018	Crumpton, Brooke
Crumpton 2018	Cultural Resources Constraints Report; Moraga-Oakland #1, #2, #3, #4 115kV TVMR 2018; PM 8101016	2018	Crumpton, Brooke
Descantes 2008	Moraga Feeder Project	2008	Descantes, Christophe
Fies 2017	Cultural Resources Constraints Report; K-1104 Targeted Circuit (Circuit #: Oakland K-1104, X-1105, X-1106), Oakland, Alameda County; PM 31234871	2017	Fies, Robin
Grant 2017	Cultural Resources Constraints Report Tear Sheet; Oakland Land Slide, Balboa Drive (Moraga-Oakland #1, #2, #3, and #4 115 kV Road Maintenance); PM 2041229	2017	Grant, Joanne
Izzi 2020	MOX E-Tag, Cultural Resources Constraints Report, Order Number 31484160	2020	Izzi, Sarah L.
Izzi 2020	Preliminary Cultural Constraints Analysis for the PG&E Moraga-Oakland X 115 kV Rebuild Project, Alameda and Contra Costa Counties	2020	Izzi, Sarah L.

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
Izzi and Hollins 2021	CRCR for Moraga-Oakland X F-Tag Landing Zone Option F and Access Road and October Landing Zone and Access Road	2021	Izzi, Sarah Hollins, Jeremy
North Tower to San Ramon	Section 10 Clearance for North Tower to San Ramon Optical Ground Wire	NA	
S-000595	A Report on the Status of Generally Available Data Regarding Archaeological, Ethnographic, and Historical Resources Within a Five Mile Wide Corridor Through Portions of Colusa, Yolo, Solano, and Contra Costa Counties, California	1974	R.F. King
S-001080	Cardno Report – Title Unknown	NA	Cardno
S-002497	Cultural Resources Overview for the East Bay Municipal Utilities District Emergency Facilities-North Oakland Area, Alameda-Contra Costa Counties, California	1980	David Chavez
S-002997	Transcon Environmental Inc., Report – Title Unknown	NA	Transcon Environmental Inc.
S-009124	A Cultural Resources Study for the Vaca Dixon-Moraga 230 kV Transmission Line Reconductoring Project, Contra Costa, Napa, and Solano Counties, California	1987	John Holson Lori Hager
S-010803	Archaeological Inspection of Additional Properties of the Gateway Valley Specific Plan and Gateway Blvd. Extension Project, Orinda, Contra Costa County, California	1989	Miley Paul Holman
S-014677	Archaeological Survey Report, "Park and Ride" lot at intersection of Park Boulevard and Monterey Boulevard, City of Oakland, Alameda County, 04-ALA-13 P.M. 7.4, EA 124060	1992	John Yelding-Sloan
S-020511	Cultural Resources Assessment, Pacific Bell Mobile Services Facility PL-066-01, Oakland, Alameda County, California (letter report)	1998	Barry A. Price
S-022702	Cultural Resources Inventory for the Lamorinda Recycled Water Project, Contra Costa County, California. A study on the Briones Valley, Las Trampas Ridge, Oakland East, Vine Hill, and Walnut Creek U.S.G.S. 7.5' Topographic Quadrangles	2000	Jeffrey Hall Eduardo Serafin Christopher D.
S-022815	Archaeological Resources Investigations for the City of Piedmont, East Bay Infiltration/Inflow Correction Program, Piedmont, California	2000	David Chavez Jan M. Hupman
S-023681	Re: Nextel Wireless Communications CA-2127D, 4230 Park Boulevard, Oakland, CA	2001	Knox Mellon Willie Yee Jr
S-030906	Caltrans Historic Bridge Inventory Update: Concrete Arch Bridges, Contract: 43A0089, Task Order: 01, EA: 43-984433, Volume I: Report and Figures	2004	Christopher McMorris
S-032580	Cultural Resources Study of the Park Place Project Metro PCS Site No. SF-18790A 3760 Park Boulevard, Oakland, Alameda County, California 94610	2006	Historic Resource Associates
S-033293	Archaeological Survey Report, BART Connector Project, Alameda County, California	2000	William Self Associates, Inc.
S-034925	Cultural Resources Study of the Park Boulevard Presbyterian Church Project T-Mobile Site No. BA22903 4101 Park Boulevard, Oakland, Alameda County, California 94602	2008	Historic Resource Associates

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
S-035671	Cultural Resources Study of the Radio Shack Project T-Mobile Site No. BA22903E 4230 Park Boulevard, Oakland, Alameda County, California 94602	2008	Historic Resource Associates
S-035892	FCC090831B: Verizon 190645 "Glenview" 601 Glendome Circle, Oakland CA 94602	2009	Milford Wayne Donaldson Jennifer "Gwen" Vito
S-036735	Archaeological Survey Report, Leimert Boulevard Bridge (33C-0215) Retrofit Project, Alameda County, California, STPLZ-5012(025) Leimert Boulevard, Oakland, California	2008	Dean Martorana
S-037017	Archaeological Survey Report, Leimert Boulevard Bridge Retrofit Project, Alameda County, California STPLZ-5012 (025)	2008	Martorana, Dean
S-037024	Historical Resources Evaluation Report, Leimert Boulevard (Sausal Creek) Bridge, Number 33C-0215, Seismic Retrofit Project STPLZ-5012 (025)	2008	Herbert, Rand
S-037047	Cultural Resources Investigation for Clearwire #CA-SFO0140A "Trestle Glen", 1305 Everett Avenue, Oakland, Alameda County, California 94602	2010	Carolyn Losee
S-038235	Cultural Resources Records Search and Site Visit for Extenet Systems MCR-012C (Montclaire Network-012C), 2140 Arrowhead Drive, Oakland, Alameda County, California (letter report)	2010	Carrie D. Wills Kathleen A. Crawford
S-038392	COE_2015_0123_001; Contra Costa-Moraga 230 Kilovolt Re-conductor Project, Orinda, California; (2012-00043S)	2015	Carol Roland-Nawi Jane M. Hicks
S-038929	Cultural Resources Investigation for AT&T Mobility CC1237 "Midcrest Road & Sunnyhills" 4101 Park Boulevard, Oakland, Alameda County, California 94602 (letter report)	2012	Carolyn Losee
S-041082	FEMA110207A; Four Hazardous Fire Risk Reduction Projects, East Bay Hills, PDM-PJ-09-CA-2005-011, PDM-PJ-09-CA-2006-004, PDM-PJ-09-CA-2005-003, and FEMA-HMGP-1731-16-34	2011	Milford Wayne Donaldson Carol Roland-Nawi
S-045103	Cultural Resources Constraints Report; NERC: Moraga-Lakewood 115kV; PM # 30950803	2014	Leroy Laurie
S-045105	Cultural Resources Constraints Report; NERC Sobrante-Moraga 115kV; PM # 30950800	2014	Leroy Laurie
S-047997	Cultural Resources Study of the Trestle Glen & Bowles Place Project, AT&T Wireless Services Site No. SNFCCA2107, 3729 Park Boulevard Way, Oakland, Alameda County, California 94610	2005	Dana E. Supernowicz
S-049318	Sausal Creek Erosion Project, City of Oakland, Alameda County; Cultural Resources Survey Report	2017	Heidi Koenig
S-049342	FCC_2017_0410_005, Glenview/EnSite 30241, 1305 Everett Avenue, Oakland, Collocation	2017	Julianne Polanco Matthew Holtkamp
S-049401	Cultural Resources Constraints Report: TSP Tower Replacement, Oakland, Alameda County (Circuit No. Moraga-Oakland Nos. 1, 2, 3 and 4 115 kV), PM 74008842	2017	Beatrice Cox
S-049891	FCC_2016_0108_006, BA12364Z (PL364 Sandri), 275 Sandringham Road, Piedmont, CA 94611	2016	Julianne Polanco
S-050585	FCC_0217_0718_001 AT&T CLL020107, 3729 Park Boulevard, Oakland, Collocation	2017	Carolyn Losee Julianner Polanco

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
Schrader III 2019	Moraga-Oakland #1, #2, #3, & #4 115kV TVMR EBMUD BAHCP 2019 8101016	2019	Schrader III, Lucian N.
Schrader III 2019	Moraga-Oakland #1, #2, #3, & #4 115kV TVMR EBRPD BAHCP 2019 8101016	2019	Schrader III, Lucian N.
Schwenessen 2016	Cultural Resources Constraints Report; Moraga-San Leandro 115kV Transmission Line Right of Way Vegetation Management; PM 8099163	2016	Schwennesen, Tad
Turner 2018	Cultural Resources Constraints Report; GPRP Melvin Road and Rosecrest Drive, Oakland, Alameda County; PM 31311570	2018	Turner, Angie
Von der Porten 2019	Cultural Resources Constraints Report; GAS SERVICE – Oakland Gas Service Installation	2018	Von der Porten, Peter
Whetherbee 2019	Moraga 1105 12kv Enhanced Vegetation Management 2019 8187527	2019	Whetherbee, Shane
Focused Studies Outside API but within 0.25 Mile			
30954282	Cultural Resources Constraints Report for DRS Mountain & Woodcrest, Oakland, Alameda County (P.M. 30954282)	2013	Cox, Beatrice Esme Hammerle
30968141	Cultural Resources Constraints Report for Gas Main Ascot & Holyrood, Oakland, Alameda County	2015	Hammerle, Esme
30968148	Cultural Resources Constraints Report: Gas Main Leimert & Oakland, Oakland, Alameda County	2014	Hammerle, Esme
Coburn 2023	CRCR for Moraga-San Leandro No1	2023	Alex Coburn
Crumpton 2019	Oakland 1104 12kV Enhanced Vegetation Management EBRPD 2019 8187527	2019	Crumpton, Brooke
Dang 2018	Cultural Resources Constraints Report; Gas Main Clarendon Crest & Seaview, Oakland, Alameda County; PM 31267989	2018	Dang, Darryl
Fies 2015	Cultural Resources Constraints Report; Gas Main St. James Dr. & Croydon, Piedmont, Alameda County, PM 31094932	2015	Fies, Robin
Fies 2017	Cultural Resources Constraints Report; Gas Main Mountain Gate and Las Aromas, Oakland, Alameda County; PM 31226863	2017	Fies, Robin
Hammerle 2014	Cultural Resources Constraints Report: GPRP Sandringham & Hampton, Piedmont, Alameda County	2014	Hammerle, Esme
Larsen 2020	Moraga-San Leandro 230kV TVMR Wilder 2020-187404 CCS	2020	Larsen, Kelly
Larsen 2020	Moraga-San Leandro 230kV TVMR Wilder 2020-187404; 8101016	2020	Larsen, Kelly
National Park Service 1996	Comprehensive Management and Use Plan and Environmental Impact Statement, Juan Bautista de Anza National Historic Trail, Arizona and California	1996	National Park Service
S-001316	Archaeological Survey Report, Rescinded Route 04-CC-77, Excess Parcels 24524-07-01, 24524-08-01, 24524-16-01, 19575-01-01, 24524-10-01, 24524-17-01, 24524-18-01, 19560-03-01, 24524-11-01, 24524-13-01, In Moraga, Contra Costa County, Calif.	1978	Cindy Desgrandchamp
S-005629	An Archaeological Reconnaissance of Sausal Creek between Leimert and Hyde Streets in the City of Oakland	1982	Bertrand T. Young George R. Miller

Preliminary and Subject to Change Based on CPUC Requirements, Final Engineering, and Other Factors

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
S-010475	Moraga Country Club Golf Course Expansion Plans, Moraga, Contra Costa County, California (letter report)	1988	Miley Paul Holman
S-020514	Cultural Resources Assessment, Pacific Bell Mobile Services Facility PL-153-18, Oakland, Alameda County, California (letter report)	1998	Barry A. Price
S-022814	Cultural Resource Reconnaissance for the Proposed East Bay Regional Park District Fire Mitigation Projects, Alameda and Contra Costa Counties, CA, HMGP #919-515-24	2000	Sean Dexter Daniel Shoup
S-032790	Phase I Cultural Resources Assessment of Proposed Cell Tower Communication Site known as Montclair, Sigma Engineering Project Number 094910, Located at 2220 Mountain Boulevard, City of Oakland, Alameda County, California (Site number--SFA-C11-210A)	2001	Allen G. Pastron
S-038228	Cultural Resources Records Search and Site Visit for Extenet Systems Candidate MCR-016A (6700 Moore Drive), Oakland, Alameda County, California (letter report)	2010	Carrie D. Wills Kathleen A. Crawford
S-038239	Cultural Resources Records Search and Site Visit for Extenet Systems Candidate MCR-006B (Across from 8601 Skyline Blvd.), Across from 8601 Skyline Boulevard, Oakland, Alameda County, California (letter report)	2010	Carrie D. Wills Kathleen A. Crawford
S-044858	Collocation Review; Oakland Hills South Outdoor Distributed Antenna System (ODAS) Network; Node: OAKS-056A, 6837Aitken Drive Oakland, California Alameda County	2013	Martin Environmental Solutions Inc.
S-044914	Collocation Review, Oakland Hills South Outdoor Distributed Antenna System (ODAS) Network, Node: OAKS-076B, 6768 Banning Drive Oakland, California, Alameda County, MartinEnviro Project Number: 2013-EXN-0039	2013	Mary Alfson Tinsman
S-044917	Collocation Review, Oakland Hills South Outdoor Distributed Antenna System Network, Node: OAKS-054B, Next to 2052 Tampa Ave, Oakland, California Alameda County, MartinEnviro Project Number: 2013-EXN-0018	2013	Mary Alfson Tinsman
S-044944	Collocation Review; Oakland Hills South Outdoor Distributed Antenna System (ODAS) Network; Node: OAKS-057B; 6415 Westover Drive Oakland, California Alameda County; MartinEnviro Number: 2013-EXN-0021	2013	Mary Alfson Tinsman
S-044946	Collocation Review; Oakland Hills South Outdoor Distributed Antenna System (ODAS) Network; Node: Oaks-058A; 6828 Saroni Drive Oakland, California Alameda County; MartinEnviro Project Number: 2013-EXN-0022	2013	Mary Alfson Tinsman
S-050862	COE_2016_1128_003, Section 106 Consultation for the J & J Ranch Subdivision Project to install a culvert and pedestrian boardwalk in Orinda, Contra Costa County, California (2009-00445S)	2017	Rick M. Bottoms Julianne Polanco
Timm 2018	Cultural Resources Constraints Report; Gas Main Chelton Drive, Oakland, Alameda County; PM 30968007	2018	Timm, Serah

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
Timm 2018	Cultural Resources Constraints Report; Gas Main Ascot and Mastlands, Oakland, Alameda County; PM 31226862	2018	Timm, Serah
Regional and Thematic Studies within 0.25 Mile			
S-000848	A Summary of Knowledge of the Central and Northern California Coastal Zone and Offshore Areas, Vol. III, Socioeconomic Conditions, Chapter 7: Historical & Archaeological Resources	1977	David A. Fredrickson
S-001978	The Islands of Contra Costa	1960	Anthony V. Aiello
S-002458	Environmental Overview of The Northwest Region	1982	Neil Ramiller
S-007903	Cultural Resources Evaluation for the East Bay Municipal Utility District Infiltration/Inflow Project (P. O. 951 1143-EA)	1985	David Chavez
S-009462	Identification and Recording of Prehistoric Petroglyphs in Marin and Related Bay Area Counties	1977	Miller, Teresa Ann
S-009583	Ecology of the Pre-Spanish San Francisco Bay Area	1978	David W. Mayfield
S-009795	Late Prehistoric Obsidian Exchange in Central California	1986	Thomas Lynn Jackson
S-014621	Archaeological Resources Review for the Oakland Enterprise Zone EIR, Alameda County, California	1992	David Chavez
S-015529	California, Oregon, and Washington: Archaeological Resource Study	1993	Robert L. Gearhart II Clell L. Bond Steven D. Ho
S-016660	Prehistoric Rock Art of Alameda and Contra Costa Counties, California	1992	Jeffrey B. Fentress
S-017773	Contract 04E634-EP, Task Order #9, Historic Map Review for CALTRANS Maintenance Facilities (letter report)	1992	Angela M. Banet
S-017835	Biological Distance of Prehistoric Central California Populations Derived from Non-Metric Traits of the Cranium	1975	Suchey, Judy Myers
S-018217	Cultural Resource Evaluations for the Caltrans District 04 Phase 2 Seismic Retrofit Program, Status Report	1996	Gmoser, Glenn
S-020395	PCNs of the Coast Ranges of California: Religious Expression or the Result of Quarrying?	1998	Donna L. Gillette
S-030204	The Distribution and Antiquity of the California Pecked Curvilinear Nucleated (PCN) Rock Art Tradition	2003	Donna L. Gillette
S-032596	The Central California Ethnographic Community Distribution Model, Version 2.0, with Special Attention to the San Francisco Bay Area, Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways	2006	Randall Milliken Jerome King Patricia Mikkel
S-033239	Alameda Watershed, Natural and Cultural Resources: San Francisco Watershed Management Plan	1994	David Chavez
S-033600	Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4	2007	Jack Meyer Jeff Rosenthal
S-035209	Limited Phase I Cultural Resources Evaluation for the City of Piedmont Sewer Rehabilitation Project - Phase IV, Located in the City of Piedmont, Alameda County, California (letter report)	2008	Allen G. Pastron

Table 5.5-2. Previous Cultural Resource Studies within 0.25 Mile of the Area of Potential Impact

Report No.	Report Title	Report Year	Report Author
S-039349	Limited Phase I Cultural Resources Evaluation for the City of Piedmont Sewer Rehabilitation Project – Phase V, Located in the City of Piedmont, Alameda County, California (letter report)	2012	Allen G. Pastron Andrew Gottsfield
S-048927	The Economy and Archaeology of European-made Glass Beads and Manufactured Goods Used in First Contact Situations in Oregon, California and Washington	1997	Donald Scott Crull
S-049780	FHWA_2016_0615_001, Caltrans District 4 Archaeological Context	2016	Julianne Polanco

DRS = District Regulator Station
EIR = Environmental Impact Report
GPRP = Gas Pipeline Replacement. Program
NERC = North American Electric Reliability Council
No. = number
PCS = Personal Communications Service
PM = Project Management

The records search also indicates that 97 cultural resources have been previously recorded within the 0.25-mile record search radius (Table 5.5-3). Most are historical structures. Of these, 31 are plotted within the API. They include two PG&E substations (Oakland X Substation [(P-01-000861] and Moraga Substation [P-07-004686]), the Moraga Substation Transformer House (P-07-004687), the Sibley Volcanic Regional Preserve Historic District (P-07-004486), the Contra Costa-Moraga Transmission Line (P-07-004688), an abandoned railroad segment (TSP-01H), and numerous private residences, commercial properties, and other utilities. Of the 66 resources outside the API but within 0.25 mile, all but 1 resource are historical built environment resources. The exception is an informally recorded bedrock mortar on an agate rock formation (C-474).

Table 5.5-3. Previously Recorded Cultural Resources within 0.25 Mile of the Area of Potential Impact

Primary No.	Other No.	Resource Age	Resource Description	Eligibility[a]
Previously Recorded Cultural Resources within the API				
P-01-000856	NA	H	Fisher (Harry P.) Store Building, 4193-97 Park Boulevard (Oakland), Serial No. 1379, a Tudor Revival store building c. 1926	7
P-01-000857	NA	H	Fisher (Harry P.) Store Building, 4201-03 Park Boulevard (Oakland), Serial No. 1383, a Tudor Revival style store buildings c. 1926	7
P-01-000858	NA	H	Fisher (H.P.) Saunder's-Hagstrom's Store, 4206-12 Park Boulevard (Oakland), a Spanish Colonial commercial building c. 1929	7
P-01-000859	NA	H	Fisher (Harry P.) Store Building, 4207-11 Park Boulevard (Oakland), Serial No. 1385, a Georgian Revival story building c. 1926	7R
P-01-000860	NA	H	Fisher (H.P) Jenny Wren-McMarr Store, 4214-24 Park Boulevard (Oakland), 1300 Glenfield. Serial No. 1389, a Spanish Colonial commercial building c. 1926	7
P-01-009324	NA	H	Spanish Colonial home c. 1936	7
P-01-009456	NA	H	Two-story rustic house c. 1932	7
P-01-009513	NA	H	Tudor Revival house c. 1926	7

Table 5.5-3. Previously Recorded Cultural Resources within 0.25 Mile of the Area of Potential Impact

Primary No.	Other No.	Resource Age	Resource Description	Eligibility[a]
P-01-010418	NA	H	Radio Shack, 4230 Park Boulevard (Oakland), a two-story building ca. 1925	7
P-01-010858	NA	H	Four-story, masonry apartment building c. 1930s	7
P-01-010892	NA	H	Park Boulevard Presbyterian Church, 4101 Park Boulevard (Oakland), a complex of buildings c. 1922-1956	7
P-01-011010	NA	H	Trestle Glen Apartments, 1305 Everett Avenue (Oakland), a two-story Masonry/Spanish Revival style commercial apartment building c. 1925	7
P-01-011120	NA	H	Togneri Residence, 1321 Leimert Boulevard, Oakland, c. 1940	7
P-01-011121	NA	H	Cooper Residence, 1301 Leimert Boulevard, Oakland, c. 1950	7
P-01-011122	NA	H	Common Area of Tract 4156, 4902 Park Boulevard, Oakland; three separate buildings including two Tudor Revival style duplexes, and a modernistic style two-story building	7
P-01-011253	NA	H	Class 5 Douglas Fir wood utility pole pre-1965	7
P-01-011377	NA	H	Several disjointed resources associated with the Sacramento Northern Railroad	7
P-01-012014	NA	H	Electric power line tower (project structure EN29)	7
P-07-004486	NA	H	Sibley Volcanic Regional Preserve, dedicated in 1936. Includes trails for hiking and equestrian riding, a c. 1940 Park residence, a modern interpretive center, and several modern bathrooms	3S
P-07-004686	NA	H	HP09 – Public utility building	7
P-07-004687	NA	H	HP09 – Public utility building	7
P-07-004688	NA	H	Built in 1949, 131 steel lattice structures extending 27 miles from the Contra Costa Powerplant to Moraga Substation	6Z
NA	1000 ELBERT ST OAKLAND	H	1000 ELBERT ST OAKLAND; 024-0561-001	7
NA	1004 ELBERT ST OAKLAND	H	1004 ELBERT ST OAKLAND; 024-0561-002	7
NA	1008 ELBERT ST OAKLAND	H	1008 ELBERT ST OAKLAND; 024-0561-003	7
NA	1012 ELBERT ST OAKLAND	H	1012 ELBERT ST OAKLAND; 024-0561-004	7
NA	1016 ELBERT ST OAKLAND	H	1016 ELBERT ST OAKLAND; 024-0561-006	7
NA	1020 ELBERT ST OAKLAND	H	1020 ELBERT ST OAKLAND; 024-0561-006	7
NA	Oakland X Substation	H	Substation built in 1908-1909 by Great Western Power Company; served as the terminus of long-distance transmission lines from hydroelectric plants on the Feather River	7

Table 5.5-3. Previously Recorded Cultural Resources within 0.25 Mile of the Area of Potential Impact

Primary No.	Other No.	Resource Age	Resource Description	Eligibility[a]
NA	TSP-01H	H	Abandoned segment of the Oakland Antioch & Eastern Railway (OA&E) grade, or locally referred to as the Montclair Railroad	7
Previously Recorded Cultural Resources Outside the API but within 0.25 Mile				
P-01-000723	NA	H	HP06 – Commercial building	7
P-01-000848	NA	H	Klee's Restaurant, a streamlined, modern style building, remodeled as postmodern. High one-story, rectangular plan. Built in 1946, with additions and remodels in 1951 and 1990	7R
P-01-000849	NA	H	C.W. Leekins site, a mid-20th century commercial building, remodeled as late 20th century. Built in 1947, remodeled in 1979	7
P-01-009275	NA	H	HP02 – Single family property	7
P-01-009336	NA	H	HP02 – Single family property	7
P-01-009377	NA	H	St. Mary Margaret's Catholic Church	7
P-01-009384	NA	H	St. Mary Margaret Parsonage	7
P-01-009403	NA	H	Tudor Revival-Provincial revival house c. 1921	7
P-01-009419	NA	H	Period revival house c. 1934	7
P-01-009420	NA	H	Provincial revival house c. 1920s	7
P-01-009423	NA	H	Provincial revival cottage c. 1933	7
P-01-009448	NA	H	An unknown historic-period resource. No record.	7
P-01-009449	NA	H	Tudor Revival house c. 1929	7
P-01-009454	NA	H	Three-story stucco Moderne house c. 1937	7
P-01-009455	NA	H	Four-plus story Spanish Colonial multilevel home c. 1933	7
P-01-009472	NA	H	Brick Mediterranean house c. 1926	7
P-01-009516	NA	H	One-and-a-half-story rustic stucco house c. 1920s	7
P-01-009517	NA	H	Chateau-style stucco apartment building c. 1939	7
P-01-009522	NA	H	HP02 – Single family property	7
P-01-009523	NA	H	HP02 – Single family property	7
P-01-009530	NA	H	HP02 – Single family property	7
P-01-009531	NA	H	HP02 – Single family property	7
P-01-009532	NA	H	HP02 – Single family property	7
P-01-009558	NA	H	Rustic cottage c. 1937	7
P-01-009561	NA	H	An unknown historic-period resource. No record.	7
P-01-009562	NA	H	Tudor Revival style house c. 1928	7
P-01-009563	NA	H	Tudor Revival house c. 1925	7
P-01-009564	NA	H	Spanish Colonial house c. 1935	7
P-01-009565	NA	H	Spanish Colonial house c. 1934	7
P-01-009566	NA	H	Spanish Colonial house c. 1929	7
P-01-009567	NA	H	Tudor Revival house c. 1929	7
P-01-009568	NA	H	Provincial revival house c. 1928	7

Table 5.5-3. Previously Recorded Cultural Resources within 0.25 Mile of the Area of Potential Impact

Primary No.	Other No.	Resource Age	Resource Description	Eligibility[a]
P-01-009569	NA	H	Mediterranean house c. 1970s	7
P-01-009596	NA	H	Provincial revival house c. 1930s	7
P-01-009604	NA	H	HP02 – Single family property	7
P-01-010680	NA	H	2401 Monterey Boulevard; residence built in 1941 in modern vernacular style	6Z
P-01-011119	NA	H	Clark Residence, 1707 Clemens Road, Oakland, two-story building c. 1939	7
P-01-011247	NA	H	Class 3 Douglas Fire wood utility pole pre-1965	7
P-01-011248	NA	H	Class 2 Douglas Fire wood utility pole, pre-1965	7
P-01-011415	NA	H	Redwood Regional Park, founded in 1934, is 1,829 acres containing redwoods, evergreens, chaparral, and grasslands	3S
P-01-011549	NA	H	Utility pole	7
P-01-011550	NA	H	Utility pole	7
P-01-011551	NA	H	Utility pole	7
P-01-011552	NA	H	Utility pole	7
P-01-011553	NA	H	Utility pole	7
P-07-000800	CA-CCO-729H	H	AH04 - Ancillary building	7
P-07-004484	NA	H	HP02 – Single family property; HP14 - Government building; HP31 - Urban open space; HP35 - New Deal public works project; HP42 - Stadium/sports arena	7
P-07-004487	CA-CCO-825H	H	AH11 - Wall/fence; AH16 - Other	7
P-07-004491	NA	H	HP02 – Single family property	7
P-07-004586	NA	H	Moraga Substation	6Z
P-07-004587	NA	H	Moraga Substation Transformer House	3S
NA	6856 COLTON BLVD OAKLAND	H	6856 COLTON BLVD OAKLAND; 048-7332-029	7
NA	6857 COLTON BLVD OAKLAND	H	6857 COLTON BLVD OAKLAND; 048-7334-026	7
NA	6878 COLTON BLVD OAKLAND	H	6878 COLTON BLVD OAKLAND; 048-7332-030	7
NA	6900 COLTON BLVD OAKLAND	H	6900 COLTON BLVD OAKLAND; 048-7332-031	7
NA	6906 COLTON BLVD OAKLAND	H	6906 COLTON BLVD OAKLAND; 048-7332-032	7
NA	6912 COLTON BLVD OAKLAND	H	6912 COLTON BLVD OAKLAND; 048-7332-033	7
NA	6918 COLTON BLVD OAKLAND	H	6918 COLTON BLVD OAKLAND; 048-7332-034	7
NA	6924 COLTON BLVD OAKLAND	H	6924 COLTON BLVD OAKLAND; 048-7332-035	7
NA	6930 COLTON BLVD OAKLAND	H	6930 COLTON BLVD OAKLAND; 048-7332-036	7
NA	6942 COLTON BLVD OAKLAND	H	6942 COLTON BLVD OAKLAND; 048-7332-037	7

Table 5.5-3. Previously Recorded Cultural Resources within 0.25 Mile of the Area of Potential Impact

Primary No.	Other No.	Resource Age	Resource Description	Eligibility[a]
NA	6948 COLTON BLVD OAKLAND	H	6948 COLTON BLVD OAKLAND; 048-7332-038	7
NA	6954 COLTON BLVD OAKLAND	H	6954 COLTON BLVD OAKLAND; 048-7332-039	7
NA	6960 COLTON BLVD OAKLAND	H	6960 COLTON BLVD OAKLAND; 048-7332-040	7
NA	6966 COLTON BLVD OAKLAND	H	6966 COLTON BLVD OAKLAND; 048-7332-041	7
NA	6972 COLTON BLVD OAKLAND	H	6972 COLTON BLVD OAKLAND; 048-7332-042	7
NA	6980 COLTON BLVD OAKLAND	H	6980 COLTON BLVD OAKLAND; 048-7332-001	7
NA	C-474	P	Bedrock mortar	7

[a] Eligibility codes: 3S - Appears eligible for NR individually through survey evaluation; 6Z – Not eligible for listing on the NRHP, the CRHR, or local designation through survey evaluation; 7 – Not evaluated for the NRHP or CRHR; 7R - Identified in Reconnaissance Level Survey or in an Area of Potential Effect (APE): Not evaluated.

AH = Historic Archaeological Site
c. = circa
H = Historic
HP = Historic Resource
NA = Not applicable
P = Precontact

A search of the NRHP, the CRHR, the California Historic Landmarks, and California Points of Historical Interest did not indicate additional cultural resources listed within the archaeological or architectural API or within 0.25 mile (NRHP 2020; OHP 2020a, 2020b).

Potential for Encountering Historic-Era Archaeological Resources

The sensitivity of the API for historic-era archaeological deposits is estimated to be low to low-moderate given the small number of archaeological sites previously recorded and other factors. If ground-disturbing activities occur near historic railroad alignments, such as the Sacramento Northern Railway (P-01-011377), there is the possibility of discovering subsurface deposits in those areas. These could include buried spur lines or refuse deposits. Additionally, the archaeological API is in an area that has been used for residential and commercial purposes continuously since the nineteenth century, so it is possible that buried refuse deposits or other archaeological material related to domestic activities could be discovered during excavation. Prior to the establishment of modern refuse disposal systems in the early twentieth century, people frequently deposited household refuse in ditches, creeks, or privies, fed it to livestock, or spread it in yards to enrich the soil. These activities could have resulted in the formation of archaeological deposits or isolated artifacts. The areas with the highest sensitivity for such resources are along the sides and rear of residential buildings.

Buried Site Sensitivity

Review of recent geologic maps and data produced by the California Geological Survey (Jennings et al.2010) finds that the API is underlain primarily by a mix of Plio-Pleistocene-aged (5.3 million years ago [mya] to 11,700 years ago) sedimentary rocks (QPc) to the east and Jurassic- to Cretaceous-aged (201.3 to 66 mya) rocks of the Franciscan Complex (KLf) and Pleistocene (more than 11,700 years ago) alluvium (Qoa) beyond to the west.

The Soil Survey Geographic Database maintained by the United States Department of Agriculture, Natural Resources Conservation Service indicates that soils of Early Pleistocene age (1.9 million to

25,000 years ago) or older have formed on the underlying geology. These include soils of the Diablo, Los Osos, and Millsholm Complexes, Urban Land, and Xerorthents.

As noted in recent geoarchaeological studies completed for Caltrans District 4 (Byrd et al. 2017; Meyer and Rosenthal 2007), which includes Alameda and Contra Costa counties, as well as other studies (for example, Meyer and Rosenthal 2008), discovery of buried sites depends on numerous factors, not just the age of the underlying landform. These include distance from watercourses, micro-topographic variations (for example, the presence of buried stream channels, former sloughs, springs, or natural levees), proximity to known archaeological sites, and the extent and severity of past disturbances.

Only one indigenous archaeological site has been previously recorded within 0.25 mile of the API, despite 109 past cultural resource studies within that range. The resource is outside the API but within 0.25 mile. The nearest freshwater source is Moraga Valley Creek, which intersects the far northeastern edge of the API, although it is usually dry in this area. The API has been partially cleared, leveled, and developed for residential and commercial uses, as well as for roadway construction and utility installation. These activities would have caused considerable subgrade disturbance, particularly on the southwestern three-quarters of the alignment, diminishing the likelihood that any buried archaeological deposits present remain intact.

Based on several site-specific variables (such as the age of the underlying landform, distance from natural freshwater sources, paucity of known archaeological sites within 0.25 mile, and extent of past disturbances), the potential for discovery of intact archaeological deposits, including buried archaeological deposits, materials, or features, by implementation of the project is estimated to be low.

5.5.1.3 Archaeological Survey

An archaeological survey of the API was conducted by Jacobs archaeologist, Katie Jacobson, between December 11 and 13, 2023. Since most of the API is hardscaped, survey targeted EBRPD lands on the northeastern side of the API where the ground surface is exposed. Approximately 93 percent (78.98 acres) of the total survey area (85.4 acres) was intensively surveyed. These areas were surveyed using transects spaced no greater than 15 meters apart. Approximately 7 percent (6.36 acres) of the survey area was surveyed at a reconnaissance level due to dense vegetation and steep slopes. Less than 1 percent (0.06 acre) of the survey area was not surveyed because of fencing around private property that prevented access. A map of survey coverage is provided in Appendix C, Appendix A, Figure 6.

Exposed soils, including the edges of paved areas, erosion features, and landscaped areas, were examined for evidence of precontact or historical cultural resources and buried archaeological deposits, such as culturally modified artifacts or changes in the color or texture of observed soils. A handheld Apple iPhone equipped with Google Earth was used to verify ground position. A trowel was used periodically to scrape away dense vegetation and duff in areas with low ground surface visibility.

No previously unrecorded archaeological or other cultural resources were identified within the survey area during the field survey; however, the plotted locations of two previously recorded resources were revisited. These include P-01-011377, an abandoned segment of the Oakland Antioch & Eastern Railway grade, last updated on March 24, 2017, and P-07-004486, the Sibley Volcanic Regional Preserve Historic District, originally recorded on October 6, 2021. Both resources were found to be in similar condition as described in the previous site records, with no record updates needed based on field observations.

The southwest portion of the survey area is in a highly developed residential portion of Northeast Oakland in the hillside neighborhood of Montclair in east-central Alameda County. Soils within these surveyed areas were variable, consisting of medium brown sandy loam, medium yellow-brown loamy silt, and light grey-brown loam with angular and subangular gravel inclusions. Overstory vegetation consists of Eucalyptus groves and native oak woodland species, including pine and bay laurel, with an understory of various annual grasses and shrubs, including blackberry brambles and ferns. Slopes ranged from gentle to extreme, averaging 20 percent, although they increase to approximately 60 to 70 percent in areas around Shepherd Canyon and around the hiking trails east of Huckleberry Botanic Regional Preserve.

Ground surface visibility in the southwest portion of the survey area was variable, ranging from poor (0 to 25 percent) in areas with dense vegetation, duff, wood chipping, ornamental landscaping, or hardscape, to fair (25 to 50 percent) where vegetation is managed in fields adjacent to private property, to good (50 to 75 percent) in areas maintained for hiking trails and riparian areas directly adjacent to San Leandro Creek. Disturbances from bioturbation, primarily rodent activity, were observed occasionally in this survey area.

The northeastern portion of the survey area is located within the lightly developed Sibley Volcanic Regional Preserve within the EBRPD in east-central Alameda County. Soils within these surveyed areas were variable, consisting of medium grey-brown clayey silt, medium brown clay loam, and yellow-brown silt with small angular and subangular gravel inclusions. Vegetation consisted of oak woodland and grassland. Overstory consisted of oak, bay laurel, and coast redwood, with an understory of bush monkeyflower, ferns, blackberry, poison oak, foothill lupine, coyote brush, native/non-native grasses, and shrubs. Slopes ranged from gentle, averaging 3 percent, to extreme, averaging approximately 50 percent in steep drainage ravines and in the hills north and south of the park road.

Ground surface visibility in the northeastern portion of the survey area was variable, ranging from poor (0 to 25 percent) in areas with dense vegetation, duff, erosion control netting, ecological restoration landscaping, or hardscaping, to good (50 to 100 percent) where vegetation is managed through grazing, on maintained trails, and on dirt driveways. Disturbances from bioturbation, primarily rodent activity, were observed throughout the survey area. Some unpaved roadways were covered with imported gravels, and modern structures were within the survey area. Much of the API in the northeastern portion has been disturbed by extensive cattle grazing. General refuse consistent with continual use as a preserve and grazing land was observed throughout the survey area, consisting of bricks, treated wooded posts, barbed wire fencing, rusty equipment, and hardware. Out-of-use roads were observed but not recorded because no diagnostic resources were present. All show faint tire tracks and signs of modern use.

5.5.1.4 Architectural Survey

Investigators who meet the Secretary of the Interior's Professional Qualification standards in Architectural History and History, per 36 Code of Federal Regulations Part 61, oversaw the completion of an architectural field survey of the entire API on March 19, April 1, April 2, and May 29, 2024. Survey methods were designed to meet local, state, and federal requirements and to follow guidance put forth in the California Office of Historic Preservation's Instructions for Recording Historical Resources. The survey also was consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 *Federal Register* 44716).

The survey was conducted from public vantage points and public ROWs. If surveyed resources were not visible or accessible from public areas, investigators completed supplemental research to record and evaluate the resources, such as review of current mapping software, historic maps, aerials, real estate records, historic newspaper databases, city directories, and other sources.

Prior to initiating fieldwork, investigators exported parcel data for the architectural API from the Alameda and Contra Costa County Assessor and ParcelQuest and uploaded it to ArcGIS Collector (refer to Appendix C, Appendix A, Figure 4). The architectural API aligns with the architectural survey area. This information included parcel boundaries, as well as relevant information such as parcel address, assessor's parcel number, and construction year. Investigators also uploaded shapefiles showing the locations of previously recorded architectural resources within the architectural API (refer to Appendix C, Appendix A, Figure 3). Investigators reviewed these parcels for the presence of architectural resources dating to 1979 or earlier. Appendix C, Appendix A, Figure 4 depicts a distribution of the results of parcel review, and notes which parcels include previously recorded resources; include resources that dates to 1979 or earlier; are vacant; include buildings constructed after 1979; and include buildings that date to 1979 or earlier but do not have unobstructed views of the project. Additional information on visual obstructions is included later in this section.

Investigators visited parcels with previously recorded resources or with resources dating to 1979 or earlier. During the architectural survey, investigators used the ArcGIS Collector application loaded with the previously mentioned shapefiles to collect geotagged photographs of each property included in the survey, including any accessory resources, as well as completed pertinent notes on architectural style, form, condition, and historic integrity. Investigators also assigned estimated construction dates to properties based on field verification of Alameda and Contra Costa County Assessors and ParcelQuest data, professional judgment, and historical research, including historic maps, aerials, newspaper databases, and other sources.

The extent of the architectural API also was field verified to determine if the project will be visible from parcels near the proposed project. In several instances, the architectural API was expanded to include the full extent of a parcel and other interrelated properties, based on existing conditions, such as flat topography, limited development, and lack of other visual intrusions. Parcels immediately adjacent to work areas or power lines were included if they had visibility of project elements that will be aboveground and permanent. Properties were excluded if vegetation, topography, or orientation meant the project will not be visible from the property. For example, properties along Park Boulevard were excluded because the work is largely subterranean, and no long-term visual changes will occur. During fieldwork, investigators assessed existing viewsheds from public vantage points, historic character and setting of the area, building orientation, existing vegetation, topography, and age of existing visual intrusions.

Built Environment resources within the API but with no potential for inclusion in the CRHR have been recorded in Appendix C, Appendix C, with each resource assigned a Resource Identifier (ID) number. No resources constructed less than 45 years ago appeared to possess exceptional significance and, therefore, were not recorded. In cases where the fieldwork observations of the API determined that there will not be a new visual change for a resource from the new lines, the resources were not documented in the survey matrix or on DPR 523 series forms. Appendix C, Appendix B1, includes a descriptive matrix of parcels within the API that have buildings dating to at least 1979, but that were excluded from survey because of obstructed views of the project. Appendix C, Appendix B2, Representative Photographs, includes images of select parcels discussed in the Appendix B1 matrix.

Resources older than 45 years of age and potentially eligible for recordation in the CRHR are summarized in Section 5.5.1.5 and were recorded on Department of Parks and Recreation (DPR) 523 series forms. These completed forms are in Appendix C, Appendix D.

5.5.1.5 Cultural Resources Results Summary

The survey did not result in the identification of new archaeological cultural resources. The background research and architectural field survey identified 81 architectural resources within the architectural API that meet the 45-year survey cutoff date (constructed in, or prior to, 1979) that had the potential to be physically or visually impacted by the project, and that required recordation in the survey results matrix or on DPR 523 forms. Out of the 81 architectural resources in the API, 70 are single family residential properties, two are multi-family residential properties, one is a set of public stairs, one is a public golf course, one is a church and a school, one is a railroad, one is park land, and four are utilities, such as substations or lines. Residential properties consisted mainly of similarly designed single family residences with Modern, Contemporary, Ranch, Mediterranean, Spanish, and Monterrey style elements.

Of the 81 resources, 5 were previously identified (Table 5.5-4) and their records were updated as part of this assessment. Three of these five resources are eligible for listing in the CRHR: Oakland X Substation (P-01-000861), the Sibley Volcanic Regional Preserve Historic District (P-07-004486), and Moraga Substation Transformer House (P-07-004587).

Table 5.5-4. Previously Identified Resources in the Architectural Area of Potential Impact

Resource ID	Primary Number	Resource Name	APN	Eligibility
1	P-01-000861	Oakland X Substation	23-474-10	Eligible
53	P-01-11337	Sacramento Northern Railway	N/A	Not Eligible
78	P-07-004486	Sibley Volcanic Regional Preserve Historic District	25-701-000-6	Eligible
79*	P-07-004586	Moraga Substation	27-101-000-4	Not Eligible
79[a]	P-07-004587	Moraga Substation Transformer House	27-101-000-4	Eligible

[a] Resource ID 79 is made up of two resources (Moraga Substation, P-07-004586, and Moraga Substation Transformer House, P-07-004587) located on the same APN 27-101-000-4.

The architectural survey identified one additional resource that is potentially eligible for inclusion in the CRHR, Resource ID 60, 44 Cortez Court, for the purposes of the project. Table 5.5-5 summarizes the assessment of potential impacts to these 4 CRHR eligible resources:

- Oakland X Substation (previously identified as eligible for listing)
- 44 Cortez Court (identified during this assessment as eligible for listing)
- Sibley Volcanic Regional Preserve Historic District (previously identified as eligible for listing)
- Moraga Substation Transformer House (previously identified as eligible for listing)

Table 5.5-5. Assessment of Potential Impacts to California Register of Historical Resources Eligible Resources

Resource ID and Name	APN	Project Element Proximity	Assessment
1 Oakland X Substation	23-474-10	Two existing air switches will be replaced at the substation. Additional work on the legal parcel will include installation of three new transition structures to facilitate connections to the lines. The four existing external Moraga–Oakland X 115 kV line connections will be disconnected from the existing EN37 and ES38 lattice steel tower structures (slated for removal) to run underground on Park Boulevard. The project will connect the underground lines to the substation with new transition structures, TN28, TS28, and TS29. The transition structures are tubular steel poles ranging from 63-68 ft tall, which are shorter and narrower in profile than the EN37 and ES38 lattice steel towers that will be removed.	No building modification is planned as part of the project. The replacement of components within the substation meant to upgrade and improve the interior connections to the 115 kV power lines are consistent with changes common to utilitarian structures and that have been carried out at the station to modify components since its construction. The project will include installation of three new transition tubular steel poles on the legal parcel. Although they will be new to the parcel and will result in a visual change, the proposed new poles keep with existing infrastructure, including lattice steel towers slated for removal (EN37 and ES38). Due to the nature and current and historic use of Oakland X Substation, the new configuration of the lines and its associated upgraded components within the station will be a less-than-significant change to the property's historic context, visual narrative, or architectural character-defining features.
60 44 Cortez Court	48E-7348-68	Two steel towers, EN18 and ES20, are slated for removal and replacement approximately 50 feet from the eligible residence. EN18 and ES20 are each 72-foot lattice steel towers. The project will replace them with structures RN17 and RS17, which are tubular steel poles measuring 112 feet and 91 feet in height, respectively.	Although construction activities may create temporary noise and vibration impacts, it is not anticipated that these will have a significant impact to any physical component of the resource, and the activities will not damage, destroy, or alter the resource or its character-defining features. In addition, although the permanent components of the project may alter the property's environmental setting, the steel towers predate the residence and its period of significance. The structures do not contribute to the significance of the residence and its setting; therefore, the change to another power structure will not impact the significance of the resource. Because of the close proximity between the structures and the house, primary visibility of the structure from the resource is of the lower portion of the tower. Thus, the increased height of the new structures will not change the overall perception throughout the parcel. In addition, the new tubular steel poles will have a narrower profile at the base and midsection than existing lattice steel towers. Based on the minimal change in existing setting as a result of the replacement structures, the proposed project will not negatively impact the property's historic context, visual narrative, or architectural character-defining features.

Table 5.5-5. Assessment of Potential Impacts to California Register of Historical Resources Eligible Resources

Resource ID and Name	APN	Project Element Proximity	Assessment
78 Sibley Volcanic Regional Preserve Historic District	25-701-000-6	Ten existing lattice steel towers and three light duty steel poles are within the portion of the existing utility corridor in the boundary of this property (EN6, ES7, EN7, ES8, EN8, ES9, EN9, ES10, ES8A and ES8B); however, only 6 of the 10 are slated for replacement. Existing structures EN6 and ES7 will be reused and renamed RN9 and RS9 and existing structures ES8A and ES8B will be removed and not replaced. Lattice steel tower structures EN7, ES8, EN9 and ES10 will be replaced with new lattice steel towers that are taller than the existing towers but within 10 feet of existing heights. Lattice steel tower structures EN8 and ES9 will be replaced with tubular steel towers that are taller than existing towers, with the EN8 replacement being 11 feet taller than the existing and the ES9 replacement being nearly 30 feet taller than the existing. The taller replacement for ES9 supports complete removal of the two existing structures ES8A and ES8B. The Oakland X-Moraga overhead power lines 3600 and 3601, which bisect the parcel, will be replaced and supported by the existing and replacement structures within the existing corridor.	Although construction activities may create temporary noise and vibration impacts, it is not anticipated that these will have a significant impact to any physical component of the resource, and the activities will not damage, destroy, or alter the resource or its character-defining features. Permanent visual impacts are possible as a result of the project from installation of new structures that are taller than the existing. The existing line corridor pre-dates establishment of the park and has historically been a component of its setting. However, the corridor and associated infrastructure do not contribute to the significance of the park. As such, physical removal of some components of the lines will not negatively impact the resource. Visual impacts will be limited because all but 2 of the 10 existing lattice steel towers will be either replaced with lattice steel towers or reused. The remaining two will be replaced with narrower profile tubular steel poles and, although these permanent components of the project will alter characteristics of the property's environmental setting, the change will not be visible or noticeable in most areas of the park and will be minor in areas where it is visible. Minor improvements (minor grading, slide removal, minor application of crushed rock) to some existing fire roads within the preserve will be completed, but these improvements will not alter visual characteristics or uses of the preserve. As such, the proposed project will not negatively impact the property's historic context, visual narrative, or character-defining features.
79[a] Moraga Substation Transformer House	27-101-000-4	Two existing circuit breakers will be replaced and two switchgears will be replaced at the substation. Additional work on the legal parcel will include installation of four replacement structures for four existing lattice steel towers (EN1, ES1, EN2, and ES2). These will be replaced in kind with new lattice steel towers. The new structures proposed to replace EN1, ES1, and ES2 will be within 5 feet of the height of the existing structures. EN2 has the greatest height difference, with the new structure proposed to be 18 feet taller than the existing structure.	Although construction may include temporary noise and vibration impacts, construction activities will present a less-than-significant impact to the property. The permanent components of the project also have a less-than-significant impact to the property's integrity aspects of design, workmanship, materials, setting, and feeling because work will not be conducted on the Transformer House. The proposed replacement of existing lattice steel towers will not impact Moraga Substation Transformer House, although the work will occur on the legal parcel. The proposed work is in kind and in character for the use of the resource. The proposed project will not negatively impact the resource's historic context, visual narrative, or any character-defining features.

[a] Resource ID 79 is made up of two resources (Moraga Substation, P-07-004586, and Moraga Substation Transformer House, P-07-004587) located on the same APN 27-101-000-4.

5.5.2 Regulatory Setting

5.5.2.1 Federal

No federal regulations related to cultural resources are applicable to the project.

5.5.2.2 State

California Register of Historical Resources

Under Section 21083.2 of CEQA, an important archaeological or historical resource is an object, artifact, structure, or site that is listed on, or eligible for listing on, the CRHR. Eligible resources are those that can be clearly shown to meet any of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- Is associated with the lives of persons important in our past.
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic value.
- Has yielded, or may be likely to yield, information important in prehistory or history.
- Automatic listings include properties that are listed on the NRHP. In addition, Points of Historical Interest nominated from January 1998 onward are to be jointly listed as Points of Historical Interest and on the CRHR.

Resources listed in a local historic register or deemed significant in a historical resources survey, as provided under PRC Section 5024.1(g), are presumed to be historically or culturally significant unless the preponderance of evidence demonstrates that they are not. A resource that is not listed on or determined to be ineligible for listing on the CRHR, not included in a local register of historical resources, or not deemed significant in a historical resources survey may nonetheless be historically significant, as determined by the lead agency (PRC Section 21084.1 and Section 21098.1).

Pursuant to Section 15064.5, a cultural resource is historically significant if it meets the criteria for listing in the CRHR (PRC Section 5024.1, Title 14 CCR, Section 4852), including the following:

- Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States; or
- Associated with the lives of persons important to local, California, or national history; or
- Embodies the distinctive characteristics of a type, period, region, or method of construction; or represents the work of an important creative individual; or possesses high artistic values; or
- Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Historic integrity is the ability of a property to convey its significance and is defined as the authenticity of a resource's historic identity, evidenced by the survival of characteristics that existed during the resource's period of significance. Historic resources must retain enough of their historic character or appearance to be recognizable as historic resources and to convey the reasons for their significance. Integrity must be evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource that has lost its historic character or appearance still may have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

Assembly Bill 52

AB 52 established that Tribal Cultural Resources (TCR) must be considered by the lead agency under CEQA and also provided for additional Native American consultation requirements to be undertaken by the lead agency. A TCR is a site, feature, place, cultural landscape, sacred place, or object that is considered of cultural value to a California Native American tribe, and that is:

- Listed or eligible for listing in the CRHR or in a local register of historical resources as defined in PRC Section 5020.1(k).
- Determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency will consider the significance of the resource to a California Native American tribe.

A project that has potential to impact a TCR such that it would cause a substantial adverse change constitutes a significant effect on the environment unless mitigation reduces such impacts to a less-than-significant level. The Governor's Office of Planning and Research has issued revised CEQA Guidelines to incorporate AB 52 requirements. Refer to Section 5.18, Tribal Cultural Resources.

California Health and Safety Code and Public Resources Code

Broad provisions for the protection of Native American cultural resources are contained in the California Health and Safety Code, Division 7, Part 2, Chapter 5 (Sections 8010 through 8030).

Several provisions of the PRC also govern archaeological finds of human remains and associated objects. Procedures are detailed under PRC Section 5097.98 through 5097.996 for actions to be taken whenever Native American remains are discovered. In addition, Section 7050.5 of the California Health and Safety Code states that any person who knowingly mutilates or disinters, wantonly disturbs, or willfully removes human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor, except as provided in Section 5097.99 of the PRC. Any person removing human remains without authority of law or written permission of the person or persons having the right to control the remains under PRC Section 7100 has committed a public offense that is punishable by imprisonment.

PRC Chapter 1.7, Section 5097.5/5097.9 (Stats. 1965, c. 1136, p. 2792), entitled Archaeological, Paleontological, and Historical Sites, defines any unauthorized disturbance or removal of a fossil site or remains on public land as a misdemeanor and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources.

5.5.2.3 Local

Because the California Public Utilities Commission has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect for air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

Background research indicated that no cultural resources designated for local listing are in the project area.

5.5.3 Impact Questions

5.5.3.1 Impact Questions

The project's potential effects on cultural resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.5-6 and discussed in more detail in Section 5.5.4.

Table 5.5-6. CEQA Checklist for Cultural 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 a historic resource pursuant to § 15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☒	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

5.5.3.2 Additional CEQA Impact Questions

None.

5.5.4 Potential Impact Analysis

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

Project impacts related to cultural resources were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.5.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts to cultural resources were evaluated for each of the criteria listed in Table 5.5-6, as discussed in Section 5.5.4.4.

5.5.4.2 Applicant-Project Measures

PG&E will implement the following cultural resource APMs:

APM CUL-1: Develop and Implement Worker Environmental Awareness Program Prior to Construction. PG&E will design and implement a worker environmental awareness program that will be provided to all project personnel involved in earth-moving activities. This training will be administered by a qualified cultural resource professional either as a standalone training or as part of the overall environmental awareness training required by the project and may be recorded for use in subsequent training sessions. No construction worker will be involved in field operations without having participated in the worker environmental awareness program, which will include, at a minimum:

- A review of archaeology, history, precontact, and Native American cultures associated with historical resources near the project
- A review of applicable local, state, and federal ordinances, laws, and regulations pertaining to historic preservation
- A discussion of procedures to be followed in the event that unanticipated cultural resources are discovered during implementation of the project
- A discussion of disciplinary and other actions that could be taken against persons violating historic preservation laws and PG&E policies
- A statement by the construction company or applicable employer agreeing to abide by the Worker Education Program, PG&E policies, and other applicable laws and regulations

APM CUL-2: Inadvertent Cultural Resource Discoveries. If unanticipated cultural resources are identified during construction, the following procedures will be initiated:

- All ground-disturbing construction activities within 100 feet of the discovery will halt immediately.
- The construction crew will protect the discovery from further disturbance until a qualified archaeologist has assessed it.
- The construction supervisor will immediately contact the project environmental inspector and the PG&E cultural resource specialist.
- The PG&E cultural resources specialist will coordinate with the state lead officials, as appropriate. If the discovery can be avoided or protected and no further impacts will occur, then the resource will be documented on DPR 523 forms, and no further effort will be required. If the resource cannot be avoided and may be subjected to further impacts, qualified personnel will evaluate the significance of the discovery in accordance with the state laws outlined previously; personnel will implement data recovery or other appropriate treatment measures, if warranted. A qualified historical archaeologist will complete an evaluation of historic period resources, while evaluation of precontact resources will be completed by a qualified archaeologist specializing in California prehistoric archaeology. Evaluations may include archival research, oral interviews, and/or field excavations to determine the full depth, extent, nature, and integrity of the deposit.

APM CUL-3: Unanticipated Discovery of Human Remains. If human remains or suspected human remains are discovered during PG&E construction, work within 100 feet of the find will stop immediately and the construction supervisor will contact the PG&E cultural resources specialist, who meets the Secretary of Interior's Standards for archaeology. Upon discovery, the Coroner Division of the Alameda County Sheriff's Office will be contacted for identification of human remains. The Coroner has 2 working days to examine the remains after being notified.

If the remains are Native American, the Coroner must notify the NAHC of the discovery within 24 hours. The NAHC then will identify and contact a Most Likely Descendant (MLD). The MLD may make recommendations to the landowner or representative for the treatment or disposition, with proper dignity, of the remains and grave goods. When proper consultation has occurred, a procedure that may include the preservation, excavation, analysis, and curation of artifacts and/or reburial of those remains and associated artifacts will be formulated and implemented.

If the remains are not Native American, the Coroner will consult with the archaeological research team and the lead agency to develop a procedure for the proper study, documentation, and ultimate disposition of the remains. If a determination can be made as to the likely identity – either as an individual or as a member of a group – of the remains, an attempt should be made to identify and contact any living descendants or representatives of the descendant community. As interested parties, these descendants may make recommendations to the owner or representative for the treatment or disposition, with proper dignity, of the remains and grave goods. Final disposition of any human remains or associated funerary objects will be determined in consultation between the landowner and the MLD.

5.5.4.3 Potential Impacts

Project impacts on cultural resources are defined by CEQA as a change in the characteristics of a resource that convey its significance or justify its eligibility for inclusion on the NRHP, CRHR, or local register. Direct impacts may occur by: (1) physically damaging, destroying, or altering all or part of a resource, (2) altering characteristics of the surrounding environmental setting that contribute to the significance of a resource, (3) allowing a resource to deteriorate through neglect, or (4) incidental discovery of archaeological resources without proper notification. Direct impacts can be assessed by determining the exact location of historical resources and assessing their significance under the NRHP and CEQA criteria, identifying the types and extent of the proposed impacts and their effect on significant resources, and determining appropriate measures to reduce impacts to less-than-significant levels. Indirect impacts may include changes to the viewshed of a significant resource through introduction of a new project element.

CEQA recommends avoidance or preservation in place as the preferred treatment for eligible properties and unique or important archaeological or historical resources (PRC 21083.2). If avoidance is not a feasible option, data recovery is a common treatment. For architectural resources, if physical changes to a property – excluding demolition – can be treated following the Secretary of Interior Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings, the project-related impact on the historical resource typically will be reduced to a less-than-significant level.

a) Would the project cause a substantial adverse change in the significance of a historic resource as defined in Section 15064.5? *Less-than-Significant Impact*.

In total, four resources were evaluated as eligible for listing in the CRHR and considered historical resources for the purposes of CEQA for this project. None of the eligible architectural resources will be significantly impacted by the proposed project. Replacement structures will be added either directly to the parcels of these eligible resources or on immediately adjacent parcels, but the project will result in a negligible visual change because the replacement structures are similar in size, type, and appearance to existing structures; or because the replacement structures will have a narrower profile than existing structures and, therefore, will be less obtrusive. With no physical impacts to these resources, the resources will retain their integrity of location, design, materials, workmanship, feeling, and association. The historic and current uses of these resources will remain intact. In addition, the character-defining features associated with each resource, such as their massing, materials, orientation, and landscape features, will remain intact and not be diminished by the combination of removing towers and undergrounding powerlines or replacing towers on the existing PG&E lines. The eligible resources will continue to be used in kind and not impacted physically or visually and will continue to convey their significance under their applicable CRHR criteria. There will be a less-than-significant impact to historical resources from this project during construction.

Project operation and maintenance of the overhead portion and substations will not change after construction of the project. Project operation and maintenance of the underground portion will not be ground disturbing typically and will occur within city streets or facilities. Should ground disturbing maintenance work be required, the underground portion is an area with low buried site sensitivity with past disturbances and, as such, will not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5; there will be less-than-significant impacts during the operation and maintenance phase.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? *Less-than-Significant Impact*.

Intensive pedestrian survey and records searches did not identify any archaeological sites within the archaeological API. Only one archaeological site has been recorded within 0.25 mile beyond the archaeological API. The potential to encounter surface archaeological resources is estimated to be low based on these negative findings and the extent of past disturbances in the API. Similarly, geoarchaeological analysis finds that given the age of the underlying landform (25,000 years or older), distance from natural freshwater sources, paucity of known archaeological sites within 0.25 mile, and extent of past disturbances, the API also has low potential for buried archaeological deposits. While no archaeological resources are known or anticipated in the API, APM CUL-1, APM CUL-2, and APM CUL-3 will further reduce the potential for less-than-significant impacts to archaeological resources during construction.

Project operation and maintenance of the overhead portion and substations will not change after construction of the project. Project operation and maintenance of the underground portion will not be ground disturbing typically and will occur within city streets or facilities in an area with low buried site sensitivity with past disturbances and, as such, will not cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5; there will be less-than-significant impacts during the operation and maintenance phase.

c) Would the project disturb any human remains, including those interred outside of formal cemeteries? *Less-than-Significant Impact*.

Existing conditions and past onsite uses do not indicate that human remains are present within the API and the API has low potential for buried or subsurface resources. However, the inadvertent discovery of human remains during project work is possible. If human remains are discovered, PG&E will implement APM CUL-3, which requires protocols for the inadvertent discovery of human remains, will be implemented to minimize potential impacts on cultural resources.

If human remains are encountered (or suspected) during onsite construction activities, Section 7050.5 of the California Health and Safety Code states that work crews must stop all work within 100 feet of the find. The work crew will secure the locations and treat the find as confidential and not disclose the location to the public. A PG&E cultural resource specialist will be contacted as soon as any suspected human remains are identified. The PG&E cultural resource specialist will promptly notify the county coroner if the remains appear human. Human burial treatment procedures are outlined in Section 7050.5 of the California Health and Safety Code and PRC Section 5097.98. Authorization from a PG&E project cultural resource specialist is required prior to resuming work in the discovery location.

Therefore, the project will not disturb known human remains, including those interred outside of dedicated cemeteries, and the potential impacts will be less than significant.

Project operation and maintenance of the overhead portion and substations will not change after construction of the project. Project operation and maintenance of the underground portion will not be ground disturbing typically and will occur within city streets or facilities in an area with no known human remains, low buried site sensitivity with past disturbances and, as such, will not cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5; there will be less-than-significant impacts during the operation and maintenance phase.

5.6 Energy

This section describes existing conditions and potential impacts on energy as a result of construction, operation, and maintenance of the project. The analysis concludes that less-than-significant impacts on energy will occur. The project's potential effects on energy resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.6-2 and discussed in more detail in Section 5.6.4.

5.6.1 Methodology and Environmental Setting

Local and state websites were reviewed for regulatory background information and information on existing energy providers and resources in Contra Costa and Alameda counties.

5.6.1.1 Methodology

The impact analysis used assumptions regarding construction-related fossil fuel use and operational energy requirements. Construction-related fossil fuel use was estimated based on the anticipated construction equipment use, vehicle trips, and helicopter use. The California Air Resources Board (CARB) Off-Road Emissions Inventory (CARB 2024b) was used to estimate the gasoline and diesel fuel used by construction equipment, based on equipment category and horsepower rating. Refer to Appendix D for energy use details.

EMFAC2021 (CARB 2024a) motor vehicle emissions model was used to estimate the gasoline and diesel fuel used by on-road vehicles, assuming the following based on VMT:

- Workers are assumed to travel in gasoline-fueled passenger vehicles (65 percent light-duty automobiles, 5 percent light-duty trucks class 1, and 30 percent light-duty trucks class 2) or gasoline-fueled light-duty trucks (14 percent light-duty trucks class 1 and 86 percent light-duty trucks class 2), even though some of these trips may occur in electric or plug-in hybrid vehicles.
- Material and equipment transport are assumed to occur in either diesel-fueled medium-duty or heavy-duty trucks (100 percent medium heavy-duty trucks or 100 percent heavy heavy-duty trucks, respectively), even though some of these trips may occur in gasoline-fueled, electric, or natural gas-fueled vehicles.
- Vendor deliveries are assumed to occur in diesel-fueled light heavy-duty trucks (80 percent light heavy-duty trucks class 1 and 20 percent light heavy-duty trucks class 2), even though some of these trips may occur in gasoline-fueled or electric vehicles.
- Construction support vehicles are assumed to occur in either diesel-fueled light heavy-duty trucks (80 percent light heavy-duty trucks class 1 and 20 percent light heavy-duty trucks class 2) or gasoline-fueled light-duty trucks (14 percent light-duty trucks class 1 and 86 percent light-duty trucks class 2).

Jet fuel use by helicopters was estimated using the methodology from the Swiss Federal Office of Civil Aviation (Rindlisbacher and Chabbey 2015), assuming up to three landing and takeoffs (LTO) and five or six hours of in-flight operation per day per helicopter. Electricity use during construction and operation of the proposed project was assumed to be minimal.

Although most construction activities were evaluated as occurring in 2027, construction energy use estimates were developed using equipment and vehicle for calendar year 2026 fleet, which is the year in which construction was expected to begin at the time of this evaluation. After this evaluation completed, the anticipated construction schedule moved to start in 2028. Even with the construction start moving forward in time, this approach provides for a more conservative energy use estimate as equipment and vehicle are expected to improve each year based on developments in energy efficiency technologies and the required use of cleaner equipment and vehicles over time.

5.6.1.2 Existing Electrical and Natural Gas Services

For electricity, Contra Costa and Alameda counties are served by a variety of service providers. Specifically:

- The City of Orinda, which is in Contra Costa County, is served by PG&E (Find Energy 2024a).
- The City of Oakland, which is in Alameda County, is served by PG&E, Ava Community Energy, and the Port of Oakland (Find Energy 2024b).
- The City of Piedmont, which is also in Alameda County, is served by PG&E and Ava Community Energy (formerly East Bay Community Energy) (Find Energy 2024b).

PG&E also provides natural gas service within Contra Costa and Alameda counties.

Contra Costa County has 29 power plants, with natural gas being the primary fuel for electricity generation. Other gases, wind, solar, and purchased steam also are used for electricity generation, but to a far lesser degree than natural gas (approximately 5 percent in total as compared to approximately 95 percent for natural gas) (Find Energy 2024a). The largest electric power generator located in Contra Costa County is the Delta Energy Center, which is an 880-MW natural gas-fired, combined-cycle electric generating facility (CEC 2024b).

Alameda County has 23 power plants, with natural gas being the primary fuel for electricity generation. Wind, biomass gas (landfill gas), and solar also are used for electricity generation, but to a far lesser degree than natural gas (a total of approximately 18 percent of the megawatt-hours produced in Alameda County compared to approximately 78 percent for natural gas) (Find Energy 2024b). The largest electric power generator located in Alameda County is the Russell City Energy Center, which is a 600-MW natural gas-fired, wet-cooled, combined-cycle electric generating facility (CEC 2024e). Of the 23 power plants in Alameda County, three are in Oakland. These three consist of two biomass plants at the East Bay Municipal Utility District wastewater treatment plant and the Oakland Power Plant near the Port of Oakland. The Oakland Power Plant, operated by Dynegy (a subsidiary of Vistra Energy), is a jet-fueled peaker power plant.

5.6.1.3 Nonrenewable Energy

Within the proposed project area, PG&E currently transmits high-voltage electricity to existing substations, where the voltage is stepped down for distribution throughout the area. PG&E provides 115 kV power between Moraga and Oakland X substations. The two existing double-circuit power lines are located within an existing PG&E right-of-way that ranges from approximately 100 to 250 feet wide, with each line supporting a 115 kV circuit to either side of a tower or pole. The project infrastructure will continue to be available for interconnection outside of the project scope from both renewable and nonrenewable energy sources. The project will not add capacity for the specific purpose of serving a nonrenewable energy resource.

The California Energy Commission (CEC) provides data on energy production sources. Table 5.6-1 shows energy production sources for the electricity providers previously identified.

Table 5.6-1. 2021 Energy Resources for Electricity Service Providers in Contra Costa and Alameda Counties

Retail Suppliers	Eligible Renewables (Total)[a]	Coal	Large Hydroelectric	Natural Gas	Nuclear	Other	Unspecified Power	Total
Ava Energy[b]	35.8%	0.0%	64.2%	0.0%	0.0%	0.0%	0.0%	100.0%
PG&E[b]	47.7%	0.0%	4.0%	8.9%	39.3%	0.0%	0.0%	100.0%

Table 5.6-1. 2021 Energy Resources for Electricity Service Providers in Contra Costa and Alameda Counties

Retail Suppliers	Eligible Renewables (Total)[a]	Coal	Large Hydroelectric	Natural Gas	Nuclear	Other	Unspecified Power	Total
Port of Oakland	49.9%	0.0%	8.7%	0.1%	0.0%	8.3%	33.0%	100.0%

Source: CEC 2024a

[a] Eligible renewable resources include biomass and biowaste, geothermal, hydroelectric, solar, and wind.

[b] Both Ava Energy (formerly East Bay Community Energy) and PG&E offer several different service plans. The energy resources shown here conservatively reflect the plans with the fewest renewables.

5.6.1.4 Existing Energy Use

Within Contra Costa and Alameda counties, total energy consumption has increased since the early 1990s. However, energy consumption has increased at a lower rate than population has increased, suggesting less energy usage per person or greater energy efficiency (CEC 2024c; U.S. Census Bureau 2024a; U.S. Census Bureau 2024b). In 2022, residential consumption of electricity in Contra Costa and Alameda counties was approximately 3,099 million kilowatt hours (kWh) and 3,195 million kWh, respectively. Non-residential consumption in Contra Costa and Alameda counties was approximately 5,239 million kWh and 7,200 million kWh, respectively (CEC 2024c). Energy consumption in the immediate project area is directly correlated with these particular land uses.

5.6.1.5 Energy Conservation

PG&E sponsors several energy conservation programs that include education, solar energy incentives, electric cars, the fluorescent lighting business program, and a weatherization program for low-income families. These services are intended to reduce energy consumption in homes through the replacement of inefficient appliances and minor housing repairs, making homes more energy efficient. Consumers also receive educational materials that provide energy-saving tips and information.

5.6.2 Regulatory Setting

The following sections contain an overview of regulations related to the use of energy and energy conservation.

5.6.2.1 Federal

Energy Policy Act of 2005

The Energy Policy Act created energy-related tax incentives from 2005 to 2016 to promote energy efficiency and conservation pertaining to renewable energy, oil and gas production and transmission, coal production, and electric generation and transmission.

Energy Independence and Security Act of 2007

On December 19, 2007, President Bush signed the Energy Independence and Security Act (EISA) with the goal of pushing the nation toward greater energy independence and security. Building on Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, EISA introduced more-aggressive requirements and created provisions that aim to further develop renewable fuel production and increase the efficiency of products, buildings, and vehicles (EPA 2024a).

American Recovery Reinvestment Act of 2009

As part of a larger stimulus package, the American Recovery Reinvestment Act authorized federal funding to the U.S. Department of Energy to forward specific energy priorities, including modernizing the nation's electric transmission grid.

Executive Order 14008, Tackling the Climate Crisis at Home and Abroad

President Biden signed Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, on January 27, 2021, to promote a safe global temperature and increase climate resilience (EPA 2024b). Executive Order 14008 requires agencies to support robust climate action and submit a Climate Action Plan. Such provisions aim to achieve a carbon pollution-free electricity sector by 2035.

5.6.2.2 State

Renewable Portfolio Standard Program

Established in 2002, California's Renewable Portfolio Standard aims to ensure that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or county. In September 2018, Senate Bill (SB) 100 was signed into law, which directed the CPUC, CEC, and CARB to plan for 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045. The law notes that new and modified electric transmission facilities may be necessary to facilitate the state achieving its renewable portfolio standard targets.

Renewable Energy Transmission Initiative

The Renewable Energy Transmission Initiative 2.0 is a statewide, nonregulatory planning effort convened by the California Natural Resources Agency, with participation from the CEC, CPUC, California Independent System Operator, and the U.S. Bureau of Land Management, California Office. The Renewable Energy Transmission Initiative 2.0 was created to explore the renewable generation potential available to California utilities to help meet statewide GHG reduction and renewable energy goals, and to identify the potential transmission implications of accessing and integrating these resources.

California 2008 Energy Action Plan Update

Originally developed in 2003 and updated in 2005 and 2008, the California Energy Action Plan identifies specific action areas to ensure that California's energy resources are adequate, affordable, technologically advanced, and environmentally sound. The plan's first-priority actions to address California's increasing energy demands are energy efficiency and demand response (namely, reduction of customer energy usage during peak periods to address system reliability and support the best use of energy infrastructure). Additional priorities include the use of renewable sources of power and distributed generation. The plan also notes that investment in conventional transmission infrastructure is crucial to helping the state meet its renewable energy goals.

Clean Energy and Pollution Reduction Act

In 2015, SB 350 was signed into law, establishing new clean energy, clean air, and GHG reduction goals for 2030 and beyond. Specifically, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030.

Integrated Energy Policy Report

The CEC adopts an Integrated Energy Policy Report every 2 years, which provides a cohesive approach to identifying and solving the state's pressing energy needs and issues. The report contains an integrated assessment of major energy trends and issues facing California's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources and ensure a reliable, secure, and diverse energy supply, among other objectives. An update is published every other year and was most recently published in February 2023 to address 2022 trends. Some of the key recommendations or actions from this update, as related to energy resources, include the following (CEC 2023):

- Examine how to balance the roles of distributed energy resources and grid assets in making the energy transition away from fossil fuels.
- Examine the role of interconnection and how utility process reform can increase the pace of distributed energy resource deployment.
- Initiated efforts to analyze opportunities for additional reliability investments and develop a Clean Energy Reliability Investment Plan.
- Enacted the Strategic Electricity Reliability Reserve to make additional generation and load reduction available during extreme events.

5.6.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations, respectively. However, plans and policies for Contra Costa County, the City of Orinda, Alameda County, the City of Oakland, and the City of Piedmont are considered for informational purposes and to assist with the CEQA review process, based on the expected location of project activities. These counties and cities are considered local agencies that must comply with their own plans and policies, as described in the following subsections.

Contra Costa County General Plan

The *Contra Costa County General Plan*, originally adopted in 1991, is currently being updated in parallel with the *Contra Costa County Climate Action Plan*, originally adopted in 2015. The General Plan provides the long-term resiliency framework of goals and policies, while the Climate Action Plan provides strategic implementation programs to show how the County will reduce GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050, in accordance with the state's adopted GHG emissions reduction targets. Together, these plans aim to accomplish the following (Contra Costa County 2024):

- Decrease energy use
- Improve energy efficiency
- Develop renewable energy
- Reduce vehicle miles traveled
- Increase multimodal travel options
- Expand green infrastructure
- Reduce waste
- Improve the efficiency of government operations

City of Orinda General Plan

The *City of Orinda General Plan* identifies goals and policies aimed at increasing energy conservation, increasing renewable energy resources, and minimizing exposure to natural and human-created hazards. Key policies associated with these energy-related goals include the following (City of Orinda 2023):

- **Policy S-52**: Renovate existing City-owned assets and design future facilities to incorporate renewable energy generation systems, battery storage systems, and energy-efficient design and features, as feasible.
- **Policy S-53**: Coordinate with East Bay Municipal Utilities District to explore ways to improve and increase energy storage capacity and generation efficiency.
- **Policy S-55**: Encourage new developments and existing property owners to incorporate sustainable, energy-efficient, and environmentally regenerative features into their facilities, landscapes, and structures to reduce energy demands and improve onsite resilience. Support financing efforts to increase community access to these features.

Alameda County Major Energy Initiatives

The Alameda County General Services Agency (GSA) aims to strengthen the community through a variety of innovations and services. These innovations include the following key energy initiatives, which have been enacted since 2001 by the GSA (Alameda County 2024):

- Financing installations of solar panels at two community housing projects
- 12 large-scale solar installations in county buildings
- 1.5-MW fuel cell power plant installation at the Santa Rita Jail
- The first net positive California jail, with Santa Rita Jail exporting 2 million watt-hours of energy to the utility grid that is allocated via energy credits to two adjacent sites—East County Hall of Justice and the Regional Training Center—reducing energy costs at those sites
- New lighting in 52 county buildings, using 30 percent less electricity
- Generating enough daytime electricity to power more than 3,000 homes
- Preventing 38,600 tons of carbon emission over the next 30 years
- Enrolling in East Bay Community Energy, from which the County procures all energy for its facilities from renewables or low-carbon resources

Although Alameda County does periodically publish a General Plan, the most recent update for 2020 focuses largely on housing developments.

City of Oakland Climate Action Plan

The City of Oakland released its *2030 Equitable Climate Action Plan* in July 2020, which aims to leverage state and regional incentives for electrification, efficiency, and energy storage. Other goals include the following (City of Oakland 2024):

- Creating green jobs for clean energy development and installation
- Transitioning building energy systems from natural gas to electricity from clean sources
- Identifying and removing barriers to strategies that support carbon reduction, adaptation, resilience, and equity goals, including community solar and energy storage
- Powering 100 percent of the city fleet with clean energy
- Piloting new low-carbon technologies
- Securing grant funding for building out clean energy infrastructure

City of Piedmont Climate Action Plan

The City of Piedmont released its *Climate Action Plan 2.0* in March 2018 that quantified the City's GHG emissions and established residential and governmental priorities to reduce the City's three largest sources of GHG emissions (City of Piedmont 2024). The *Climate Action Plan 2.0* also includes several specific objectives to support state and local GHG emission reduction goals. Some of these objectives include increasing renewable energy consumption to 100 percent, reducing energy consumption, and accelerating the adoption of electric vehicles (City of Piedmont 2024).

5.6.3 Impact Questions

5.6.3.1 Impact Questions

The project's potential effects on energy were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.6-2 and discussed in more detail in Section 5.6.4.

Table 5.6-2. CEQA Checklist for Energy

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Result in potential significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

5.6.3.2 Additional CEQA Impact Question

The project's potential effects on energy also were evaluated using the CPUC's Additional CEQA Impact Questions for Energy in the *Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments* (CPUC 2019). This additional impact question is evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are presented in Table 5.6-3 and discussed in more detail in Section 5.6.4.

Table 5.6-3. Additional CEQA Impact Questions for Energy

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Add capacity for the purpose of serving a nonrenewable energy resource?	☐	☐	☒	☐

5.6.4 Potential Impact Analysis

Project impacts related to energy were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.6.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts related to energy was evaluated for each of the criteria listed in Table 5.6-2 and Table 5.6-3 and discussed in Sections 5.6.4.3 and 5.6.4.4.

5.6.4.2 Applicant-Proposed Measures

The project will have less-than-significant impacts on energy. Implementation of APM GHG-1 will further minimize potential impacts. APM GHG-1 (refer to Section 5.8.4.3) will simultaneously reduce greenhouse gas emissions and contribute to the reduction of energy resources.

5.6.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) **Would the project result in potential significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?? *Less-than-Significant Impact.***

The project is not expected to change the use by customers of energy resources delivered through the power lines, or otherwise indirectly result in wasteful, inefficient, or unnecessary consumption of energy resources

Construction of the project is evaluated using an expected duration of approximately 43 months and the temporary consumption of nonrenewable resources to fuel construction vehicles, equipment, and helicopters. PG&E's engineering and construction staff also have developed an efficient construction plan and sequence that minimizes vehicle trips and avoids wasteful, inefficient, or unnecessary consumption of energy. Implementation of APM GHG-1, which minimizes unnecessary construction vehicle idling time, will further reduce energy consumption.

As shown in Table 5.6-4, construction of the project will result in the consumption of an estimated 35,422 gallons of gasoline, 309,231 gallons of diesel, and 38,119 gallons of jet fuel.

Table 5.6-4. Summary of Estimated Fuel Consumption During Construction

Project Activity	Gasoline (gallons)	Diesel (gallons)	Jet Fuel (gallons)
Construction Duration	35,422	309,231	38,119

As compared to the statewide total fuel consumption for 1 year, the project's construction activities will consume a minimal amount of fuel, less than 0.01 percent of the statewide fuel consumption, as shown in Table 5.6-5. Therefore, the consumption of these energy resources will not be unnecessary, inefficient, or a wasteful use and construction of the project will result in a less-than-significant impact.

Table 5.6-5. Summary of Estimated Fuel Consumption During Construction Compared to Statewide Fuel Consumption

Project Activity	Fuel Type	Estimated Amount of Fuel Consumed (gallons)[a]	Statewide Fuel Resources Consumed (gallons)[b]	Consumed by Project (%)
Construction	Gasoline	35,422	12,746,185,200	0.0003%
	Diesel	309,231	2,373,378,000	0.013%
	Jet Fuel	38,119	4,530,960,000	0.001%

[a] Total gallons of fuel consumed for project construction represents the total gasoline, diesel, and jet fuel from employee vehicle trips, construction equipment, vendor delivery truck trips, material and equipment hauling truck trips, and helicopter operation during the construction phases, as applicable.

[b] Source: CEC 2024d. A conservative estimate of annual statewide fuel resources consumed is assumed to be equivalent to 100 percent of annual production/stocks consumed within the state for the period of January 1, 2023 through December 31, 2023.

Operation and maintenance of the project will similarly require the consumption of nonrenewable resources to fuel vehicles, equipment, and helicopters. However, because the project involves the rebuilding of existing infrastructure, future energy consumption for operation and maintenance is expected to be at the same level as currently used. For this reason, fuel consumption for operation and maintenance of the project was not estimated. With no increase in operation and maintenance fuel consumption as compared to current levels, operation and maintenance of the project will result in no impact.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? *No Impact*.

The project will enable reliable and ongoing delivery of electricity to the East Bay, including from renewable energy sources. It will not conflict or obstruct state or local plans for renewable energy or energy efficiency.

5.6.4.4 Additional Impact Question

c) Would the project add capacity for the purpose of serving a nonrenewable energy resource? *Less-than-Significant Impact.*

The project will not add capacity for the specific purpose of serving a nonrenewable energy resource. However, the project infrastructure will continue to be available for interconnection from both renewable and nonrenewable energy sources. A less-than-significant impact will result.

5.6.4.5 CPUC Draft Environmental Measures

None.

5.7 Geology, Soils, and Paleontological Resources

This section describes existing conditions and potential impacts on geology, soils, and paleontological resources as a result of construction, operation, and maintenance of the project. The analysis concludes that, although these resources will be temporarily affected by project construction, project-related impacts to geology, soils, and paleontological resources will be less than significant. The APMs, as described in Section 5.7.3.3, will further reduce impacts. The project's potential effects were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.7-6 and discussed in more detail in Section 5.7.3.

5.7.1 Methodology and Environmental Setting

5.7.1.1 Methodology

Information on the geology and soils in the project area was compiled from published literature and maps and via examination of aerial photographs. Geologic units and geologic hazard zones were evaluated based on maps published by the California Geological Survey (CGS) and USGS. Soil descriptions were obtained from mapping by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS).

Geologic and paleontological reports (Appendix E3, Appendix E2, Appendix E4, and Appendix E1) were prepared to inform the impact analysis and design of the rebuilt power lines, including the following:

- *Draft Geotechnical Investigation, Moraga–Oakland X 115-KV Transmission Line Rebuild Project, Alameda and Contra Costa Counties, California*, prepared by Kleinfelder, September 13, 2024. The investigation evaluated subsurface conditions along the project alignment and developed conclusions and recommendations to guide geotechnical aspects of design and construction planning.
- *Hayward and Chabot Fault Location Uncertainty Evaluation for a Utility Corridor – Oakland, CA*, prepared by Lettis Consultants International, Inc. (LCI), January 30, 2024. The evaluation provides information characterizing the location of the Hayward and Chabot faults in the vicinity of the Moraga–Oakland utility corridor, including documentation of fault information and location uncertainty.
- *Moraga–Oakland X Landslide Hazard Evaluation*, prepared by InfraTerra, Inc., July 22, 2024. This evaluation summarizes results of mapping of landslides and associated erosion hazards for existing and proposed replacement structures along existing electrical power lines that connect Moraga Substation with Oakland X Substation.
- *Paleontological Resources Impact Evaluation Report*, prepared by Earthview Science, June 17, 2024. This evaluation assessed paleontological impacts associated with the project and compliance with laws, ordinances, regulations, and standards pertaining to paleontological resources.

Existing paleontology data were analyzed according to PG&E Paleontological Resources Standards and Procedures (PG&E 2015). The analysis included (1) geologic map review, (2) scientific literature review, (3) institutional paleontological records search, and (4) aerial imagery review. Several geological maps were reviewed for this analysis. The map that provided the most detailed surficial geology of the project area was Graymer (2000) at a 1:50,000 scale. Geological and paleontological literature relevant to the project area was reviewed. Databases from the University of California, Museum of Paleontology (UCMP) and Paleobiology Database (PBDB) were searched for paleontological records within 1 mile of the project area (PBDB 2023; UCMP 2023). Google Earth aerial imagery was reviewed for physiographic context and land use. The study area for this evaluation includes the maximum project footprint plus a 0.5-mile buffer beyond the project.

5.7.1.2 Regional and Local Geologic Setting

The project area is within the Coast Range geomorphic province (CGS 2002), extending approximately 5 miles from the East Bay Hills to the sloping alluvial plain along the Bay. The complex geology of the East Bay Hills reflects the forces that have shaped the region. The East Bay Hills are a sequence of Mesozoic rocks overlain by younger strata. The Franciscan Complex, likely composed of Jurassic oceanic crust, pelagic deposits, and turbidites, underlies most of the Bay Area and crops out in a portion of the study area (Graymer 2000). Another Bay Area basement rock sequence crops out in the project area – the Great Valley Complex, representing accreted and deformed ocean crust and thick turbidite sequences. It can be divided into the Great Valley Sequence and Coast Range Ophiolite, both of which crop out in the project area. Younger, fault-bounded rock bodies are grouped into assemblages (Graymer 2000). The project area contains rock sequences from Assemblage I, which dates from the Paleocene to the Miocene, and Assemblage II, which dates to the Pliocene.

West of the East Bay Hills is the San Francisco Bay Area coast plain. The San Francisco Bay occupies a depression in the Coast Ranges between the San Andreas Fault to the west and the Hayward Fault to the east. This depression filled with sediments eroded from the hills and deposited by streams flowing into the Bay, forming a thick layer of sediment from the Pleistocene and Holocene periods. The west end of the study area is on an alluvial fan extending from the hills toward the Bay.

Major geographic features in the project area include the Hayward Fault line, Sausal Creek, and Shephard Creek. The topography in the area consists of rolling hills, vegetated canyons, and higher elevations in the eastern and central sections of the project. A more gradual slope with less topographical variation occurs along the project alignment in the western portion of the project. Project elevation ranges from approximately 650 feet above sea level at Moraga Substation to approximately 1,370 feet above sea level when the lines crest the Oakland Hills, and then it descends to approximately 140 feet above sea level at Oakland X Substation.

5.7.1.3 Geologic Units

The East Bay Hills, along with the Diablo Mountain Range and the San Francisco Bay, are within the Coast Range geomorphic province, a belt of sedimentary, volcanic, and metamorphic rocks that include the Franciscan Complex. Bedrock in the Coast Range geomorphic province ranges in age from Jurassic to Pleistocene. In the San Francisco Bay area, the oldest rocks are deformed Mesozoic sedimentary and volcanic rocks of the tectonically accreted Mesozoic Franciscan Complex and the contemporaneous Great Valley Sequence. During the Last Glacial Maximum, significant relief of the bedrock was formed resulting from incision of creeks and streams to reach the elevation of the global sea level, approximately 140 feet lower than it is today. As sea level rose, lowland areas in the San Francisco Bay area were subject to the deposition of a transgressive sequence of alluvial sediments. Younger alluvial deposits have accumulated in the valleys in the region because of weathering in the surrounding mountains.

Geologic units in the study area are shown on the map on Figure 5.7-1 and described in the following sections from youngest to oldest (Earthview Science 2024).

Quaternary Deposits

These deposits span recent, Holocene, and Pleistocene periods. In the study area, they are in valley bottoms and at the west end of the project area along the coastal plain.

- Artificial fill (af) is material deposited by humans from various sources.
- Stream channel deposits (Qhsc) are Holocene-age sand, clay, silty sand, or sandy gravel with minor cobbles of modern stream courses.
- Holocene alluvial deposits (Qhaf) are brown to tan, medium dense to dense, gravely sand or sandy gravel that grades upward to sandy or silty clay. The best-developed Holocene alluvial fans are on

the San Francisco Bay plain. All other alluvial fans and fluvial deposits are confined to narrow valley floors.

- Quaternary alluvial deposits (Qpaf) are Pleistocene-age alluvial and fluvial deposits. They are brown, dense, gravelly and clayey sand or gravel that grades upward to sandy clay. These deposits are along most modern stream channels outboard of Holocene deposits. They are distinguishable from younger deposits by higher topographic position, greater degree of dissection, and stronger soil profile development. They are overlain by Holocene deposits on the lower parts of the alluvial plain and incised by channels partly filled with Holocene alluvium on higher parts of the alluvial plain.

Assemblage I

Assemblage I is a series of Miocene to Paleocene-age rock bodies at the eastern end of the project area, notable for containing volcanic material (Graymer 2000). The constituent rock bodies are relatively narrow and form a series of East Bay Hills ridges at the east end of the study area. Assemblage I rock bodies in the study area include:

- Siesta Formation (Tst) is a narrow, late Miocene-age formation that outcrops for approximately 6 miles, extending 4 miles north of the project area and 2 miles to the south. It consists of nonmarine siltstone, claystone, sandstone, and minor limestone.
- Moraga Formation (Tmb and Tms) is a late Miocene-age volcanic rock body with two subunits: Tmb and Tms. Tmb is basalt and andesite with minor rhyolite tuff that crops out discontinuously across approximately 9 miles. Its north end is broad, narrowing to the south. Tms is part of the Moraga Formation, consisting of interflow sedimentary rocks.
- Orinda Formation (Tor) is a late Miocene-age formation widespread in the East Bay Hills. It is distinctly to indistinctly bedded, pebble to boulder conglomerate, conglomeratic sandstone, coarse- to medium-grained lithic sandstone, and green and red siltstone and mudstone. Conglomerate clasts are subangular to well rounded and contain a high percentage of detritus derived from the Franciscan Complex.
- Claremont chert (Tcc) is a late to middle Miocene-age laminated, bedded chert, minor brown shale, and white sandstone. Chert crops out as distinct, massive to laminated, gray or brown beds. Distinctive black, laminated chert crops out locally in the Berkeley Hills.
- Glauconitic mudstone (Tsm) is Miocene and Oligocene-age brown mudstone interbedded with sandy mudstone with prominent glauconite grains. The unit is bounded below and above by faults. It was mapped as Sobrante(?) Formation by Radbruch (1969).
- Mudstone (Tes) is Eocene-age green and maroon, foraminifera-rich mudstone, locally interbedded with hard, distinctly bedded, mica-bearing, quartz sandstone. This unit is bounded above and below by faults.
- Glauconitic sandstone (Ta) is Paleocene-age, coarse-grained, green, glauconite-rich, lithic sandstone with well-preserved coral fossils. Locally interbedded with gray mudstone and hard, fine-grained, mica-bearing quartz sandstone. Outcrop of this unit is restricted to a small, fault-bounded area in the Oakland Hills.

Assemblage II

Mulholland Formation (TmII) is a Pliocene-age formation of mostly sandstone and mudstone. It forms the ridgeline at the eastern edge of the study area but does not underlie the project area.

Great Valley Sequence

Great Valley Sequence is a series of Jurassic and Cretaceous-age rock bodies. These units are thickly deposited accumulations of mudstone, sandstone, and conglomerate. They represent sequences of turbinates deposited on the oceanic crust. The Great Valley Sequence is west of Assemblage I and includes the following units:

- Redwood Canyon Formation (Kr) is distinctly bedded, cross-bedded to massive, thick beds of biotite, quartz-rich wacke, and thin interbeds of mica-rich siltstone.
- Shephard Creek Formation (Ksc) is distinctly bedded mudstone, shale, mica-rich siltstone, and thin fine-grained, mica-rich wacke beds.
- Oakland conglomerate (Ko) is massive, medium- to coarse-grained biotite, quartz-rich wacke, and prominent interbedded pebble to cobble conglomerate lenses. Conglomerate clasts are distinguished by a large amount of silicic volcanic detritus, including quartz porphyry rhyolite.
- Joaquin Miller Formation (Kjm) is thinly bedded shale with minor sandstone. The shale grades into thinly bedded, fine-grained sandstone near the top of the formation.
- Keratophyre (Jsv) are highly altered intermediate and silicic volcanic and hypabyssal rocks.

Coast Range Ophiolite

West of the Great Valley Sequence is a series of rock bodies known as Coast Range Ophiolite. It is a slab of oceanic upper mantle and crust formed from the middle to the late Jurassic. The ophiolite sequences that occur in the study area include:

- Massive basalt and diabase (jb) are types of igneous rock with a similar composition. Basalt is considered extrusive because it cools on or near the surface whereas diabase cools underground.
- Serpentinite (sp) is a metamorphic rock that forms in midocean ridges and in subduction zones.

Franciscan Complex

West of Coast Range Ophiolite is a series of rock bodies known as the Franciscan Complex, which consists in this area of deformed and metamorphosed sedimentary and volcanic rocks of late Jurassic to late Cretaceous age. The Franciscan Complex units in the study area are:

- Sandstone Novato Quarry (Kfn) is distinctly bedded to massive, mica-bearing, lithic wacke. Where distinctly bedded, sandstone beds are about 1 meter thick and siltstone interbeds are a few centimeters thick. Sedimentary structures are well preserved.
- Franciscan Complex (KJfm) is sheared black argillite, graywacke, and minor green tuff, containing blocks and lenses of graywacke and meta-graywacke, chert, shale, metachert, serpentinite, greenstone, amphibolite, tuff, eclogite, quartz schist, greenschist, basalt, marble, conglomerate, and glaucophane schist. Blocks range in size from pebbles to several hundred meters in length.
- Graywacke and meta-graywacke (fs) are sandstone rocks formed by submarine currents when sediment-laden water moves rapidly down a slope forming a sort of underwater avalanche. A mass of sediment, called a turbidit, is deposited on the seafloor.

The mapped geologic units and subsurface conditions that underlie project structures are shown in Table 5.7-1 (Kleinfelder 2024). Refer to Figure 3.5-1 for locations of project structures.

Table 5.7-1. Mapped Geologic Units and Subsurface Conditions

Project Structure ID	Mapped Geologic Unit and Subsurface Conditions
RN1, RS1, RN2, RS2	Siesta Formation (Tst). Boring B-9 at Twr 0/1 encountered sandy fat clay in upper 3 to 4 feet, underlain by weathered claystone, consistent with mapped geology.
RN3, RS3, RN4, RS4	Moraga Formation Interflow Sedimentary Rocks (Tms). Boring B-8 near Twr 0/3 encountered 1 to 2 feet fat clay with sand at ground surface, underlain by weathered sandstone, consistent with mapped geology.

Table 5.7-1. Mapped Geologic Units and Subsurface Conditions

RN5, RS5, RN6, RS6, RN7, RS7, RN8, RS8	Orinda Formation (Tor). Fat clay observed at ground surface. Mapped description notes conglomerate/conglomeritic sandstone, consistent with field observations.
RN9, RS9	Claremont Chert (Tcc). Mapped description is layered chert with shale and sandstone layering, consistent with field observations.
RN10, RS10, RN11, RS11, RN12, RS12	Glauconitic Mudstone (Tsm). Boring at Twr 1/10 encountered highly weathered sandstone (sandy silt to silty sand).
RN13, RS13, RN14, RS14	Mudstone (Tes). The mapped description notes this material is locally interbedded with hard quartz sandstone.
RN15, RS15	Glauconitic Sandstone (Ta). The mapped description notes this sandstone is coarse-grained and highly weathered.
RN16, RS16, RN17, RS17	Redwood Canyon formation (Kr). Mapped description notes massive wacke (sandstone) to siltstone. This description is consistent with field observations of bedrock outcroppings.
RN18, RS18	Shephard Creek Formation (Ksc). Mapped description notes interbedded mudstone, shale, siltstone, and sandstone.
RN19, RS19	Oakland Conglomerate (Ko). Mapped description notes massive sandstone and pebble to cobble conglomerate.
RN20, RS20	Franciscan Complex Chert (sp). In Hayward/Chabot fault zone. Foundation conditions are likely to be highly variable.
RN21, RS21	Franciscan Complex Melange (fs). In Hayward/Chabot fault zone. Foundation conditions are likely to be highly variable.
RN22, RS22	Franciscan Complex Melange (fm).
RN23, RS23, RN24, RS24, RN25, RS25	Sandstone Novato Quarry (Kfn). Mapped description notes bedded to massive wacke. During site reconnaissance at Twrs 3/24 and 3/25, we observed the upper 2 to 3 feet to include fat clay with sand. This near-surface clay tends to creep down-slope.
RN26, RS26, TN27A, TN27B, TS27A, TS27B	Sandstone Novato Quarry (Kfn). Mapped description notes bedded to massive wacke.
Borings B-3 and B-4 (underground segment along Park Boulevard between Estates Drive and Glenfield Avenue)	Sandstone Novato Quarry (Kfn). Fill encountered up to 3.5 to 4 feet thick. Fill is highly variable and includes pavement aggregate base materials, stiff lean clay, and sandy lean clay that appears to be derived from the native near-surface bedrock. Below depths of approximately 3 to 8 feet, the sandstone and shale layers become hard/very dense. Groundwater was not encountered in the bedrock portion.
Borings B-1 and B-2 (underground segment along Park Boulevard between Glenfield Avenue and Oakland X Substation)	Pleistocene-age alluvium (Qpaf). Fill encountered up to 2 to 4 feet thick. Fill is highly variable and includes pavement base materials described as sandy gravel to well-graded sand with fine to coarse gravel. Very stiff lean clay and sandy lean clay, interlayered with dense clayey sand and clayey sand with fine gravel encountered below the fill.

Source: Kleinfelder 2024

5.7.1.4 Seismic Hazards

Fault Zones

Active Faults

For the purposes of this analysis, active faults within approximately 10 miles that may potentially affect the project were identified using the USGS Interactive Fault Map (USGS and CGS 2024). The fault map shown on Figure 5.7-2 includes Quaternary faults that fall into four categories including "historic" (has generated earthquakes accompanied by surface rupture during approximately the last 150 years), "latest Quaternary" (has shown evidence of fault displacement during approximately the last 15,000 years), "late Quaternary" (evidence of fault displacement during approximately last approximately 130,000 years), or "undifferentiated Quaternary"(evidence of fault displacement during approximately the last 1.6 million years) (USGS and CGS 2024). For the purposes of this evaluation, a fault is considered "active" if it is designated as a "latest Quaternary" or Historic fault. Three active faults are located within approximately 10 miles of the project, including the Hayward Fault, which crosses the overhead portion of the proposed project alignment near SR 13, and the Calaveras and Concord Faults, which are approximately 6.5 and approximately 10.1 miles from the proposed project, respectively. No other faults considered active are located within approximately 10 miles of the project alignment (refer to Figure 5.7-2).

In addition, several faults considered inactive are within approximately 10 miles of the project. These include the Franklin Fault, approximately 5.9 miles from the proposed project, and the Mount Diablo Thrust Fault, approximately 7 miles from the proposed project. Refer to Figure 5.7-2.

The project's geotechnical investigation identified additional significant faults within 30 miles of the proposed project (Kleinfelder 2024), including the San Andreas Fault approximately 18 miles from the project. Significant faults identified within approximately 10 to 30 miles of the project are listed in Table 5.7-2.

Table 5.7-2. Significant Faults within 10 to 30 Miles of the Project

Fault Name	Closest Distance to the Project (miles)
Green Valley	14.1
Clayton	14.1
Mission	15.6
Greenville	15.8
San Andreas	18.1
Great Valley 05 (Pittsburg-Kirby Hills)	19.2
Pilarcitos	21.8
San Gregorio	22.0
West Napa	22.3
Point Reyes	22.8
Monte Vista Shannon	23.9
Silver Creek	25.5
Rodgers Creek-Healdsburg	26.4
Great Valley 06 (Midland)	28.1

Source: Kleinfelder 2024

Descriptions of the three Alquist-Priolo Fault Hazard Zones within approximately 10 miles of the project are presented in the following subsections.

Hayward Fault

The Hayward Fault, a northwest-striking right-lateral (dextral) slip-strike fault, is the central part of a 195-mile-long Rodgers Creek-Hayward-Calaveras fault system. It extends from San Jose approximately 74 miles northward along the base of the East Bay Hills to San Pablo Bay. The Hayward Fault is characterized by (1) moderate aseismic creep rates, (2) microseismicity and historical earthquakes (1868 magnitude 6.5 earthquake), and (3) relatively simple fault geometry (in some cases, it includes two creeping traces) with local structural complexities (Lienkaemper 1992, 2008; Lettis 2001). The creep rate for the Hayward Fault is estimated to range from approximately 4.0 to 7.2 millimeters per year (mm/year) (Lienkaemper et al. 2014; McFarland et al. 2017), while the long-term geologic slip rate for the southern section of the Hayward Fault, which extends from near the Oakland-Berkeley border to San Jose, is estimated at approximately 9 mm/year (Field et al. 2013). Creep refers to the slow, aseismic movement along a fault. Unlike sudden seismic slip that occurs during earthquake events, creep occurs gradually over time. The long-term slip rate represents the average rate of fault movement over geological timescales. Ideally, it corresponds to the deep slip rate along the fault. During earthquakes, the shallow portion of the fault catches up to the deeper portion, resulting in episodic slip. The section of the Hayward Fault crossed by the project alignment is actively exhibiting fault creep (CGS 2003). Detailed studies of aseismic creep-related deformation and a compilation of fault studies by Lienkaemper (1992, 2008) help to constrain fault location along much of the fault length.

Calaveras Fault

The Calaveras Fault is a northwest-striking right-lateral (dextral) slip-strike fault. It is approximately 76 miles long, extending from the San Andreas fault near Hollister and terminating at Danville at its northern end. The Calaveras Fault experiences a creep rate of approximately 3 to 4 mm/year (Galehouse and Lienkaemper 2003). The most recent moderate earthquakes were a magnitude 5.1 event in 2022 and a magnitude 5.6 event in 2007. The last large event was the 1984 Morgan Hill earthquake with a magnitude of 6.2.

Concord Fault

The Concord Fault is a northwest-striking right-lateral (dextral) slip-strike fault. It is approximately 11 miles long and extends from Mount Diablo to the Carquinez Strait. The Concord Fault is connected to, and considered to be part of, the same fault zone as the Green Valley Fault, which lies just a few miles to the north across Suisun Bay. The Concord Fault experiences a creep rate of approximately 2.5 to 3.5 mm/year (Galehouse and Lienkaemper 2003). The last large earthquake linked to this fault occurred more than 400 years ago.

Alquist-Priolo Earthquake Fault Zones

The Alquist-Priolo Act requires the establishment of "earthquake fault zones" along surface traces of known active faults in California. An active fault, for the purposes of the Alquist-Priolo Act, is one that has ruptured in the last 11,000 years.

The Hayward Fault is the only fault within the project vicinity (100 feet of the project alignment) with an associated Alquist-Priolo Earthquake Fault Zone. The Chabot Fault was determined not to have sufficient evidence for Holocene activity and, therefore, was not considered in the revised Alquist-Priolo Fault Zone (LCI 2024). The Hayward Earthquake Fault Zone, which is crossed by the project alignment, is shown on Figure 5.7-2.

Fault Rupture

Displacement Magnitude

An earthquake in 1868 (moment magnitude [Mw] 7.0) was the most recent significant earthquake along the Hayward Fault, with surface rupture extending approximately 30 miles from the Montclair district of Oakland south to Fremont. Lawson (1908) describes reports of up to 3 feet of displacement as a result of the 1868 surface rupture on the Hayward Fault. Lienkaemper and Williams (1999) trenched the Hayward Fault in the ballfield in Montclair Park and found evidence of rupture in the 1868 earthquake. Vertical offset of 6 centimeters (cm) (2.4 inches) was used to infer 80 cm (2.6 feet) of right-lateral displacement produced by the 1868 earthquake.

Probabilistic estimates of coseismic (during the earthquake event) displacement and afterslip (post-event movement) calculated as part of the HayWired Earthquake Scenario for the Hayward Fault (Hudnut et al. 2018) estimates a maximum coseismic surface displacement of more than 2 meters(approximately 7 feet) and 0.5 to 1.5 meters (approximately 1.5 to 5 feet) of afterslip (Detweiler and Wein 2017). The HayWired Earthquake Scenario, led by the USGS, anticipates the impacts of a hypothetical magnitude-7.0 earthquake on the Hayward Fault.

Fault Trace Locations

A project-specific study by Lettis Consultants International, Inc. (LCI 2024) reviewed the faults and traces of the Hayward Fault and the Chabot Fault, as well as the fault location uncertainty zones. At the site, two traces of the Hayward Fault (eastern and western traces) intersect the Moraga–Oakland X 115 kV utility corridor as mapped by Lienkaemper (2008) and Graymer (2000) (LCI 2024). The Hayward Fault traces are moderately well constrained based on creep features and tectonic geomorphology and consistently mapped by various authors.

Eastern Trace: The LCI study (2024) notes that the eastern trace of the Hayward Fault was originally mapped by Radbruch (1969). Later studies delineated the eastern trace of the fault as a series of west-facing scarps in Pleistocene alluvium, linear drainages, and deflected drainages. LCI noted the eastern Hayward Fault trace generally is coincident with a faulted contact mapped by Graymer (2000). The discontinuous eastern trace makes a small, 22-meter (72-foot) left step across Shephard Creek and Palo Seco Creek before crossing the western trace of the Hayward Fault approximately 1,300 feet northwest of the utility corridor. The LCI study (2024) provided a revised location for the eastern trace of the Hayward Fault, crossing the project alignment approximately at SR 13, as well as a fault location uncertainty zone. Near the project alignment, the eastern fault trace is mapped as an alignment of southwest-facing scarps, slope breaks, and linear troughs.

Western Trace: The LCI study (2024) noted that the western trace of the Hayward Fault is mapped by Lienkaemper as a series of discontinuous northwest-striking traces ranging from 800 to 1,500 feet in length. In the vicinity of the Moraga–Oakland utility corridor, Lienkaemper (2008) constrains the western trace through several field observations of creep along the fault and alignment arrays that identify specific fault locations.

Chabot Fault Trace: The LCI study (2024) noted that the Chabot Fault is a northwest-striking, steeply east-dipping fault that is considered a splay of the larger, more-active Hayward Fault system. The fault crosses the project alignment at approximately Shephard Creek. The geomorphology along the fault is relatively poorly expressed with limited evidence of significant late Pleistocene and Holocene faulting and LCI concurs with past assessments that the Chabot Fault is not a Holocene fault. All available studies indicate the Chabot Fault is inactive (pre-Holocene) and LCI agrees with this assessment based on its review of geomorphology and local fault studies.

Strong Ground Motion

The project crosses the active Hayward Fault zone as defined by the Alquist-Priolo Act (Bryant and Hart 2007). However, the project is in an area that is subject to ground shaking from earthquakes generated on faults associated with the Coast Ranges, primarily the Calaveras, Hayward, and San Andreas faults, but including other more distant faults (Galehouse and Lienkaemper 2003; Lienkaemper 1992, 2008; Lettis 2001; and Kleinfelder 2024). Shaking from an earthquake can result in structural damage and can trigger other geologic hazards such as liquefaction. Ground shaking is affected by the earthquake magnitude, duration, and distance from the source. Ground conditions also will influence impacts from strong ground motions. Seismic waves attenuate with distance from their sources, so estimated bedrock accelerations are highest in areas closest to the source. Local soil conditions may amplify or dampen seismic waves as they travel from the underlying bedrock to the ground surface.

The project is in the seismically active San Francisco Bay region, which has experienced repeated moderate to large earthquakes. Notable historic seismic events affecting the project area are presented in Table 5.7-3 (CGS 2024). The most recent Uniform California Earthquake Rupture Forecast (UCERF3) (Field et al. 2013) assigns a 72 percent chance that the San Francisco Bay region will experience one or more magnitude-6.7 or greater earthquakes in the next 30 years and a 51 percent chance of a magnitude 7.0 or greater earthquake. In addition, there is a 98 percent chance of one or more magnitude-6.0 or greater earthquakes hitting the San Francisco Bay region in that same timeframe. There is a corresponding probability of 32 percent that the Hayward-Rodgers Creek Fault will produce an earthquake of magnitude greater than 6.7 in the next 30 years, the highest probability for any San Francisco Bay region fault other than the San Andreas Fault (LCI 2024). Therefore, it is likely that the project will experience periodic minor to moderate earthquakes and potentially a major earthquake (magnitude 7.0 or greater) during its service life.

Table 5.7-3. Major Historical Earthquakes in San Francisco Bay Area

Date	Magnitude[a]	Name, Location, or Region Affected	Epicenter Latitude	Epicenter Longitude	Approximate Distance from Project (miles)
2014, August 24	6.0	South Napa	38.22	-122.31	27.5
1989, October 17	6.9	Loma Prieta	37.04	-121.88	57.3
1984, April 24	6.2	Morgan Hill	37.31	-121.68	45.8
1911, July 1	6.6	Morgan Hill area	37.25	-121.75	47.1
1906, April 18	7.8	Great San Francisco Earthquake	37.70	-122.50	18.6
1898, March 31	6.4	Mare Island	38.20	-122.50	30.3
1892, April 19	6.6	Vacaville	38.40	-122.00	40.8
1868, October 21	7.0	Hayward Fault	37.70	-122.10	10.5
1865, October 8	6.5	Santa Cruz Mountains	37.20	-121.90	46.4
1838, June	Uncertain; 7.4 estimated	San Francisco to San Juan Bautista	37.30	-122.15	36.6
1836, June 10	Uncertain;6.4 esti mated	Near San Juan Bautista[b]	36.90	-121.50	74.8

Source: California's Big Earthquakes https://www.conservation.ca.gov/cgs/earthquakes/big

[a] Includes earthquakes of magnitude greater than or equal to 6.5, or that caused loss of life or more than $200,000 in damage.

[b] Older reports noted that this quake was possibly larger and centered near Oakland.

Liquefaction

Liquefaction is a phenomenon in which saturated cohesionless soils, such as sand and silt, temporarily lose their strength and liquefy when subjected to dynamic forces, such as intense and prolonged ground shaking. The vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity. To be susceptible to liquefaction, potentially liquefiable soils must be saturated or nearly saturated. In general, liquefaction hazards are most severe in saturated soils within the upper 50 feet of the ground surface. The potential for liquefaction increases with shallower groundwater.

The project area generally is not located within a known area of liquefaction hazard as shown on Figure 5.7-3 (USGS 2006); however, localized areas of low to high liquefaction potential occur within the project area, including the following:

- **Moraga Substation**: Moraga Substation is in an area mapped as none or moderate susceptibility to liquefaction; however, the project does not include any structural modifications to the substation. This area is underlain by Holocene-age alluvial and fluvial deposits (Qhaf).
- **State Route 13 Overhead Lines Crossing**: The area immediately adjacent to the southbound (west) side of SR 13 (Shephard Creek alignment) at the overhead lines crossing is mapped as high susceptibility to liquefaction. This area is underlain by Pleistocene-age alluvial and fluvial deposits (Qpaf).
- **Park Boulevard Underground Portion (Partial):** The underground portion of the project alignment along Park Boulevard between the Glenview District retail area and Oakland X Substation is mapped as very low susceptibility to liquefaction. This area is underlain by Pleistocene-age alluvial and fluvial deposits (Qpaf).

These areas of potential liquefaction are shown on Figure 5.7-3. Based on the findings of the geotechnical investigation performed for the project (Kleinfelder 2024), soils underlying the underground part of the project alignment and Oakland X Substation consist generally of stiff to very stiff clays and dense sands and gravels, and groundwater during borings taken at the substation was encountered at a depth of approximately 45 feet. These soil and groundwater conditions are not susceptible to significant liquefaction or related effects (Kleinfelder 2024).

Landslides

A landslide is a mass of rock, soil, or debris that has been displaced downslope by sliding, flowing, or falling. Landslides and mudslides generally have the potential to occur in areas with steep slopes. Several factors contribute to landslide risk, including slopes greater than 15 percent; weak, unconsolidated, or shallow soils; water saturation; a history of landslides; active earthquake faults; and extensive grading or vegetation removal (from fires or development activity). Historic landslides in an area make it more likely that that there will be future landslides in that area. The deformation from a landslide results in lower soils strength (remolded strength). Slope failures occur most frequently during and following the rainy season when high groundwater (elevated pore pressure) conditions persist. Landslides also can occur during or following earthquakes, triggered by the strain induced in soil and rock by the ground-shaking vibrations, or following significant rainfall events.

As shown on Table 5.7-4, steep slopes (15 to 75 percent) are present within most of the project area, and landslide risk is exacerbated by the presence of the Hayward Fault. The project area is located within a known landslide hazard area, as indicated by the California Landslide Susceptibility Map (Figure 5.7-4) prepared by CGS (CGS 2010).

An assessment of conditions and potential geologic hazards, including desktop compilation and analyses of available geologic and soil data and satellite imagery in Google Earth, was prepared in November 2024 by InfraTerra, Inc. (InfraTerra 2024). Landslide inventory mapping performed for this study provides a basis for determining the most likely locations for future shallow and deep-seated slope failure based on identification of past and current slope movement. The desktop interpretation of light detection and ranging (LiDAR) and aerial imagery for this project, validated by field reconnaissance, confirms the presence of numerous landslides along the central and eastern portions of the project corridor; however, field reconnaissance documented the absence of active slope failure extending beneath existing and proposed aboveground structure locations. Study findings are summarized in the following subsections.

Aboveground Structures

No landslides have been identified beneath proposed aboveground structures. Two proposed locations are located near active or prehistoric/older slides, with the structures typically located uphill from mapped landslides. Locations with nearby slides that could potentially extend uphill toward structures include proposed structures RN8 and RS16. However, these locations are on intact ground with no evidence of recent undercutting or active encroachment from the slides lower on the slope.

CGS (2003) mapped a large landslide extending beneath Park Boulevard just east of the intersection with Estates Drive (near milepost 3.9). This slide appears to have been identified based on interpretation of historic aerial imagery and was not confirmed as part of InfraTerra's assessment (InfraTerra 2024). The replacement structures are located east of the slide margin and are therefore not considered at risk from the slide, if present.

Underground Portion

Relatively few and generally shallow slides are mapped in the vicinity of the underground portion of the project, and no mapped landslides are crossed by the underground route.

5.7.1.5 Soils

Soils are a mixture of organic matter from biological activity and minerals weathered from rock and alluvium. The USDA NRCS compiles soil data from across the country and makes them available through its Web Soil Survey (NCRS 2024). Soil units within the project area are shown on Figure 5.7-5, and mapped soil units over which the project route passes are listed in Table 5.7-4.

Table 5.7-4. NRCS Soil Units and Properties that the Project Intersects

NRCS Soil Unit	NRCS Soil Unit Name	Slope	Erosion Hazard (On-/Off-Road) Ratings	Corrosion of Concrete Rating	Corrosion of Steel Rating	Shallow Excavation Rating	Dwellings Without Basements – Shrink/Swell Potential
Contra Costa County							
CkB	Cropley clay	2 to 5%	Slight/Slight	Low	High	Somewhat Limited	1.00
DdE	Diablo clay	15 to 30%	Severe/Moderate	Low	High	Very Limited	1.00
FaG	Felton loam	50 to 75%	Severe/Very Severe	Low	Low	Very Limited	No Rating
LcF	Lodo clay loam	30 to 50%	Severe/Severe	Low	Low	Very Limited	0.27
LhF	Los Osos clay loam	30 to 50%	Severe/Severe	Low	High	Very Limited	1.00
MeG	Millsholm loam	20 to 60%	Severe/Severe	Moderate	Moderate	Very Limited	0.02
Alameda County							
126	Maymen loam	30 to 75%	Severe/Very Severe	Moderate	Moderate	Very Limited	No Rating
127	Maymen-Los Gatos complex	30 to 75%	Severe/Very Severe	Low	Moderate	Very Limited	No Rating
152	Urban land-Tierra complex	15 to 30%	No Rating	Low	No Rating	No Rating	No Rating
158	Xerorthents-Los Osos complex	30 to 50%	No Rating	Low	No Rating	No Rating	No Rating
159	Xerorthents-Millsholm complex	30 to 50%	Severe/Severe	High	Moderate	Very Limited	No Rating
MeGcc	Millsholm loam	20 to 60%	Severe/Severe	Moderate	Moderate	Very Limited	0.02

Source: NRCS 2024

The erosion hazard rating indicates the hazard of soil loss. The on-road rating is for unsurfaced roads and trails; the off-road rating is for off-road and off-trail areas after disturbance activities that expose the soil surface. On-road ratings are based on soil erosion factor K, slope, and content of rock fragments while off-road ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The hazard is described as "slight," "moderate," "severe," or "very severe."

The corrosion of concrete rating is based on the sulfate and sodium content, texture, moisture content, and acidity of the soil. The corrosion of steel rating is based on the soil moisture, particle size distribution, acidity, and electrical conductivity of the soil. Both rating systems express rates as "low," "moderate," or "high."

The shallow excavation rating is an evaluation of the ease of digging to approximately 6 feet, based on the ease of digging and the soil's resistance to sloughing. A "somewhat limited" rating describes soil that could be moderately difficult to excavate, but difficulties can be overcome by engineering protocols. A "very limited" rating describes a soil that could prove difficult to excavate and could require significant engineering maintenance.

The Dwelling without Basement – Shrink/Swell Potential is not directly applicable to the project as no building modifications are planned; however, it is a proxy for evaluating overall shrink/swell potential of shallow soils. The shrink/swell potential rating is shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Subsidence

Subsidence is the relative downward displacement of the ground surface, which can be induced by groundwater extraction, consolidation of underlying material, or through seismic displacement or liquefaction. Groundwater extraction that leads to subsidence occurs on a regional scale over long periods of time; however, there are no significant regional scale groundwater extraction activities occurring in the project area. Earthquake-related subsidence also can occur because of liquefaction as sediments densify as a result of shaking. The potential for ground subsidence attributable to earthquake motion depends on the magnitude, duration, and frequency of the earthquake waves and corresponds to liquefaction potential. As discussed in Section 5.7.1.3, soils underlying the project alignment and Oakland X Substation are not susceptible to significant liquefaction or related effects.

Erosion

Erosion is the process by which rocks, soil, and other land materials are abraded or worn away from the Earth's surface over time. The rate of erosion depends on many factors, including soil type and geologic parent materials, slope and placement of soils, and human activity. The potential for erosion is highest in loose, unconsolidated soils. The steepness of slopes and absence of vegetation also are factors that increase the natural rates of erosion. Thus, erosion potential is high in steep, unvegetated areas, especially those disturbed by grading or other construction activities.

Within Contra Costa County, the erosion hazard for soil within the project area ranges from slight to very severe, with severe being the most common classification. Within Alameda County, the erosion hazard ratings generally ranged from severe to very severe; however, two soil units were unrated.

The project-specific assessment of conditions and potential geologic hazards by InfraTerra (InfraTerra 2024) described previously identified and mapped 36 erosion sites in the vicinity of the project based on interpretation of available LiDAR and aerial imagery; they were confirmed where accessible via field reconnaissance. These potential erosion sites generally consist of hillside gullies, incised slope erosion, and creek or drainage crossings. Several locations along the proposed aboveground and underground portions have an elevated level of impact of moderate erosion hazard, including a location near structures ES3 and RS3 and a location near structures EN23 and RN21 east of Mountain Boulevard.

Soil Stability

Unstable soils can result in liquefaction, landslides, erosion, subsidence, cyclical shrink/swell, and collapse. Susceptibility of soils to liquefaction, landslides, subsidence, and erosion are discussed in previously.

Within Contra Costa County, the shrink/swell potential of soil within the project area ranges from almost no limitation (0.02) to substantial impact (1.00) on development. Within Alameda County, most soil types in the project area are not rated for adverse impacts from shrink/swell potential; however, one soil unit is rated as having a very low potential (0.02) for adverse impact on development.

No known areas of soil susceptible to collapse have been identified in the project area.

5.7.1.6 Paleontological Resources

Paleontological resources are fossilized remains, traces, or imprints of organisms preserved in or on the Earth's crust. In additional to known paleontological resources, the paleontological report (refer to

Appendix E1) analyzed the paleontological significance and sensitivity of geological units in the study area.

Fossils

Many of the geologic units associated within the study area are not known to be fossiliferous or have no fossil records associated with them in this area. No fossil collection localities are documented within the study area. The geologic units in the study area in which vertebrate macrofossils have been found are, from youngest to oldest: Pleistocene-age sediment, Siesta Formation, Moraga Formation, Orinda Formation, Claremont Formation, and Mulholland Formation.

Few records of invertebrate fossils were found for the geologic units in the project area in Contra Costa or Alameda counties. These included two invertebrate fossils recorded for the Siesta Formation. Three invertebrate fossils were recorded as part of the Orinda Formation. In addition, three invertebrate fossil localities are recorded as part of the Redwood Canyon Formation; however, no specimen type is listed for any of the localities. Well-preserved fossil corals are reported in Graymer (2000) and Alden (2023) in glauconitic sandstone on Saroni Drive within half a mile of the project area. Microfossils are present in various units in the study area but, when present, generally are found in abundance.

Pleistocene-Age Fossils. Pleistocene-age fossils have been found on the East Bay Coastal Plain in sediment mapped as Holocene or Pleistocene at the surface. The west end of the project area is on Pleistocene-aged sediment (Qpaf). Thirteen fossil locality records are within 5 miles of the project area. The closest fossil locality is at Montclair Playground, less than 1 mile from the project area. The other 12 localities are more than 2 miles away.

Siesta Formation Fossils. The Siesta Formation (Tst) is an Assemblage I geologic unit of late Miocene age. It forms a narrow belt, oriented northwest-southwest near the east end of the project area. Fifteen fossil localities in this unit, 11 of which are vertebrates. The closest localities are the Curtis locality 2 miles southwest of the project area and 5 localities in the Siesta Valley approximately 2 miles northwest. The other fossil localities are all within 4 miles of the project area.

Moraga Formation Fossils. Two fossil localities were recorded in the Moraga Formation (Tmb and Tms). The first is less than 2 miles from the project area. The second is approximately 2.5 miles from the project area and is recorded as having been found in volcanic tuff.

Orinda Formation Fossils. The Orinda Formation (Tor) has at least 20 records of vertebrate fossil localities in Contra Costa County. The locality known as Bellshire is the closest to the project area at approximately 1.5 miles north. Several others, including the Caldecott Tunnel and Orinda localities, are approximately 2 miles away.

Claremont Formation Fossils. Four records of vertebrate fossils were found in Alameda County in the Claremont Formation, but none in Contra Costa County. They were found during the fourth bore of the tunnel, less than 2 miles from the project area.

Mulholland Formation Fossils. The Mulholland Formation (TmII) has yielded many Pliocene-age vertebrate fossils. This formation is approximately 0.5 mile east of Moraga Substation.

Paleontological Sensitivity

PG&E uses definitions of significance and sensitivity based on the Federal Land Policy and Management Act (FLPMA) of 1976, as well as standards developed by agencies and professional societies, including the Bureau of Land Management (BLM), Society for Vertebrate Paleontology (SVP), and the California Department of Transportation (PG&E 2015). This assessment finds that the project area has paleontological sensitivity ranging from very low to high (BLM Potential Fossil Yield Classification [PFYC] System Classes 1 to 4). In this system, geologic units are classified based on the relative abundance of scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. It is important to note that although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class. The relative abundance of significant localities is the primary determinant for the class assignment. PFYC criteria were applied to the geologic units in the study area as summarized in Table 5.7-5. These sensitivity ratings incorporate the geologic unit description in Section 5.7.1.3 and literature and records search in Section 5.7.1.1. The ratings also incorporate the extent of proposed earth-moving activities discussed in Chapter 3.

Table 5.7-5. Paleontological Sensitivity of Geologic Units in Study Area

Geologic Unit	Paleontological Sensitivity – PFYC Category	Basis for Sensitivity Rating
Af – Artificial fill	1: very low	Artificial fill has lost its geological context.
Qhsc – stream channel deposits	2: low	Holocene-age sediment generally is considered too young to contain scientifically significant fossils.
Qhaf – Alluvial/fluvial deposits (Holocene)		
Qpaf – Alluvial/fluvial deposits (Pleistocene)	4: high	The project area crosses Pleistocene-age sediment at its west end. Significant vertebrate fossils are periodically found in Qpaf sediment. Because of the extent of excavation for the duct banks and vaults in this unit, there is a high probability that vertebrate fossils will be encountered.
Tst – Siesta Formation	4: high	This formation has many fossil localities relative to the small size of the outcrop. Twelve fossil localities were found within 4 miles of the project area.
Moraga Formation – Tmb and Tms	3a: moderate	Two vertebrate localities were found in these formations. Both are within 2 miles of the project area. This is considered a moderate concentration of fossils considering the extent of the outcrops.
Tor – Orinda Formation	4: high	This formation has 20 vertebrate fossil localities in the East Bay. Several of these are within 2 miles of the project area.
Tcc – Claremont chert	3a: moderate	Only four fossil localities are attributed to this formation. All four were found in the drilling of the Caldecott Tunnel.
Tsm – glauconitic mudstone	2: low	No vertebrate fossil records were found for this unit despite it being disturbed by Caldecott tunnel boring.
Tes – mudstone	2: low	This unit is known to be foraminifera-rich (Graymer 2000). But these microfossils are abundant in this unit.
Ta – glauconitic sandstone	4: high	Well-preserved fossil corals are reported in Graymer (2000). Alden (2023) describes them as being found on Saroni Drive within half a mile of the project area.
Tmll – Mulholland Formation	2: low	This formation is fossiliferous but is limited to the study area's eastern margin. It crops out on a ridge east of Moraga Substation. Because the geology changes greatly over small areas, project activities will not likely disturb this formation.
Kr – Redwood Canyon Formation	3: moderate	This formation has yielded a couple marine invertebrate fossils across a large area.
Ksc – Shephard Creek Formation	2: low	No fossil records were found for this unit.
Ko – Oakland Conglomerate	2: low	No fossil records were found for this unit.
Kjm – Joaquin Miller Formation	2: low	No fossil records were found for this unit.

Table 5.7-5. Paleontological Sensitivity of Geologic Units in Study Area

Geologic Unit	Paleontological Sensitivity – PFYC Category	Basis for Sensitivity Rating
Jsv – Keratophyre	1: very low	Intrusive igneous rocks are not paleontologically sensitive.
Jb – Massive basalt and diabase	1: very low	Coast Range Ophiolite are intrusive igneous rocks and other rocks are not considered paleontologically sensitive.
Sp – Serpentinite		
Kfn – Sandstone Novato Quarry	2: low	Fossils have been discovered in this unit in Marin County, but none have been found in Alameda County or Contra Costa County.
KJfm – Franciscan Complex	2: low	Franciscan Complex units have undergone low-grade metamorphic processes. Macrofossils are lacking in these units with rare exceptions. Microfossils are present but are found in abundance.
Fs – Graywacke and meta-graywacke		

Excavation activities deeper than 3 feet in the following geological units have high paleontological sensitivity and have high potential to encounter paleontological resources:

- Tst – Siesta Formation
- Tor – Orinda Formation
- Ta – Glauconitic sandstone
- Qpaf – Alluvial/fluvial deposits (Pleistocene)

Excavation activities in other units have very low to moderate potential to encounter paleontological resources. These units include the following:

- Af – Artificial fill
- Qhsc – Stream channel deposits
- Qhaf – Alluvial/fluvial deposits (Holocene)
- Tmb/Tms – Moraga Formation
- Tcc – Claremont chert
- Tsm – Glauconitic mudstone
- Tes – Mudstone
- TmII – Mulholland Formation
- Ksc – Shephard Creek Formation
- Ko – Oakland Conglomerate
- Kjm – Joaquin Miller Formation
- Jsv – Keratophyre
- Jb – Massive basalt and diabase
- Sp – Serpentinite
- Kfn – Sandstone Novato Quarry
- KJfm – Franciscan Complex
- Fs – Graywacke and meta-graywacke

There is potential to encounter geologic units of greater sensitivity at depth and also potential – although relatively low – for unanticipated fossil discovery in geologic units determined to be of low to moderate sensitivity.

5.7.2 Regulatory Setting

5.7.2.1 Federal

Earthquake Hazards Reduction Act of 1977

The Earthquake Hazards Reduction Act of 1977 is a law formulating a national policy to diminish the dangers of earthquakes in the United States. The Earthquake Hazards Program is part of the USGS Natural Hazards Mission Area and is the USGS component of the multi-agency National Earthquake Hazards Reduction Program (NEHRP), established by Congress in 1977. The USGS Advanced National Seismic System was established by Congress as an NEHRP facility. The NEHRP agencies pursue the goals of the program through collaboration with each other and numerous partners. In addition to other federal agencies, program partners include state and local governments, universities, research centers, professional societies, trade associations and businesses, as well as associated councils, commissions, and consortia. NEHRP's work encompasses research, development, and implementation activities. Program research helps to advance understanding of why and how earthquakes occur and impact the natural and built environments. The program develops strategies, tools, techniques, and other measures that can reduce the adverse effects of earthquakes and also facilitates and promotes implementation of these measures, thereby strengthening earthquake resilience among at-risk communities. The following federal laws protect paleontological resources on federal lands as well as projects funded or overseen by federal agencies.

Antiquities Act of 1906

The Antiquities Act of 1906 (Title 16 USC Sections 431–433) was enacted with the primary goal of protecting cultural resources in the U.S. This act explicitly prohibits appropriation, excavation, injury, and destruction of any historic or prehistoric ruin or monument, or any "object of antiquity" located on lands owned or controlled by the federal government, without prior permission of the secretary of the federal department that has jurisdiction over the site. The act also establishes criminal penalties, including fines and imprisonment, for these acts. The Antiquities Act contains a requirement for studies by qualified experts in the subject matter and contains precise stipulations regarding the management/curation of collected materials. Although the Antiquities Act itself and its implementing regulation (Title 43, Code of Federal Regulations, Section 3) do not specifically mention paleontological resources, "objects of antiquity" have been interpreted to include paleontological resources by the National Park Service (NPS), the BLM, the U.S. Forest Service (USFS), and other federal agencies.

5.7.2.2 State

Alquist-Priolo Earthquake Fault Zoning Act

California enacted the Alquist-Priolo Special Studies Zones Act in 1972, which was renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994. Also known as the Alquist-Priolo Act, it requires the establishment of "earthquake fault zones" along known active faults in California (Bryant and Hart 2007). Regulations on development within these zones are enforced to reduce the potential for damage resulting from fault displacement. Information on earthquake fault zones is provided for public information purposes (refer to Section 5.7.1.4, Seismic Hazards, for further discussion).

Seismic Hazards Mapping Act

The Seismic Hazard Mapping Act (SHMA) of 1990 addresses earthquake hazards other than fault rupture, including liquefaction and seismically induced landslides. Seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The SHMA states that "it is necessary to identify and map seismic hazard zones in order for cities and counties to adequately prepare the safety element of their general plans and to encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety." Section 2697(a) of the SHMA additionally requires that "cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard."

California Public Resources Code

The State of California Public Resources Code (Chapter 1.7), Sections 5097.5 and 30244, includes additional state-level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, define the removal of paleontological sites or features from state lands as a misdemeanor, and prohibit the removal of any paleontological site or feature from state land without permission of the applicable jurisdictional agency. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands. Further, California Penal Code Section 622.5 sets the penalties for damage or removal of paleontological resources.

5.7.2.3 Local

Because the California Public Utilities Commission has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land use regulations. The following subsections analyze local regulations related to geologic and seismic hazards for informational purposes and to assist with CEQA review. Local regulations informing on soil (specifically erosion) is included in Section 5.10.2.3. These specific documents are discussed:

- *City of Orinda Safety Element* (Orinda 2023)
- *Contra Costa County General Plan* (Contra Costa County 2005)
- *Oakland 2045 General Plan Safety Element* (Oakland 2023)
- *City of Piedmont General Plan* (Piedmont 2020)

The *Alameda County General Plan* does not cover the project alignment because all portions of the project alignment within Alameda County are within the jurisdiction of the City of Oakland or the City of Piedmont. Although PG&E is not subject to local discretionary permitting, ministerial permits will be secured, as required.

City of Orinda

Section 2.3 of the *City of Orinda Safety Element* (Orinda 2023) outlines geologic and seismic hazards. Section 3.3 defines goals, policies, and actions related to those hazards. Goals and policies that may be relevant to the project include the following:

GOAL S-3: A community that seeks to minimize risks to public health, safety, and welfare resulting from geologic and seismic hazards.

- Policy S-23 Minimize fault rupture hazards through enforcement of the following policies:
  - Require infrastructure systems, such as energy, communications, and transportation infrastructure, that cross a fault be designed to resist fault rupture for the maximum plausible earthquake scenario.

No provisions related to paleontological resources were found for the City of Orinda.

Contra Costa County

Sections 10.6 and 10.7 of the *Contra Costa County General Plan* (2005) identify seismic hazards and ground failure and landslide hazards, respectively.

Seismic hazard implementation measures include the following:

- 10-c. Require comprehensive geologic and engineering studies for any critical structure, whether or not it is located within a Special Studies Zone.
- 10-e. Evaluate and, where necessary, upgrade water distribution, sewage disposal, gas and electricity, communications, and other service facilities in areas subject to seismic hazards.

Ground failure and landslide implementation measures include the following:

Regarding paleontological resources, the *Contra Costa County General Plan* calls out significant ecological resource areas in the county, including four areas with high concentrations of fossils, the closest of which is Siesta Valley, approximately 2 miles from the project area (Contra Costa County 2005, page 8-5). The plan stipulates that developers “provide information to the County on the nature and extent of the biotic resources that exist in the area. The County Planning Agency shall be responsible for determining the balance between uses of the land and the protection of resources. The cumulative impacts on the natural resources from other rural uses, such as agriculture, mining, or wind energy, must be examined and addressed as part of the review of applications. Both public and private stewardship of the resources within unique natural areas shall be considered as long as the protection is long-term and guaranteed in some manner.”

City of Oakland

Section 2.1 of the *Oakland 2045 General Plan Safety Element* (Oakland 2023) outlines geologic and seismic hazards and includes the following goals and polices that may be relevant to the project:

GOAL SAF-1: Minimize the Risk to Life and Property Caused by Seismic and Geologic Hazards

- SAF-1.1 Seismic Hazards. Develop and continue to enforce and carry out regulations and programs to reduce seismic hazards and hazards from seismically triggered phenomena. Prioritize programs in areas of highest seismic risk and seismic vulnerability.
- SAF-1.4 Seismic Hazard Coordination. Work with other public agencies to reduce potential damage from earthquakes to lifeline utility, economic, and transportation systems, including Caltrans; BART; PG&E, EBMUD, and other utilities providers; the Port of Oakland; and others.

Regarding paleontological resources, the Open Space, Conservation, and Recreation Element of the City of Oakland General Plan stresses the importance of paleontological resources as follows: “Some of Oakland's most important natural assets are ‘earth resources,’ including soils and minerals, archaeologic and fossil remains, and the geologic formations that define the city's topography” (Oakland 1996, page 3.2). However, the General Plan does not explicitly address paleontological resources in policies, goals, or objectives.

City of Piedmont

Section 6 of the *City of Piedmont General Plan* (Piedmont 2020) identifies geologic and seismic hazards, including strong ground motions, landslides, and liquefaction. The General Plan includes the following mitigations related to seismic and geologic risks:

The City of Piedmont adopted a Local Hazard Mitigation Plan (Piedmont 2019) that includes the following actions, which may be relevant to the project:

- Action 23. Implementing Hillside Hazard Overlay District to Address Slope Stability Hazards

No provisions related to paleontological resources were found for the City of Piedmont.

5.7.3 Impact Questions

The project’s potential effects on geology, soils, and paleontological resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.7-6 and discussed in more detail in Section 5.7.3.

Project impacts on paleontological resources were evaluated based on an assessment of the paleontological sensitivity of identified geologic formations in relation to the proposed project activities. In accordance with Appendix G of the CEQA Guidelines, project impacts on paleontological resources were considered significant if the project will directly or indirectly destroy a unique paleontological resource or site. Sensitivity ratings were used to assess the likelihood and severity of project impacts. The paleontological sensitivity ratings provided in Table 5.7-5, which combine numerous relevant considerations, are measured in light of the nature of subsurface disturbance associated with the project, and the significance of impacts is determined based on that information.

Table 5.7-6. CEQA Checklist for Geology, Soils, and Paleontological Resources

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
c) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
iv. 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?	☐	☐	☒	☐
v. Strong seismic ground shaking?	☐	☐	☒	☐
vi. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
vii. Landslides?	☐	☐	☒	☐
d) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
e) Be located on a geologic unit of 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?	☐	☐	☒	☐
f) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
g) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
h) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

5.7.3.1 Additional CEQA Impact Questions

None.

5.7.4 Potential Impact Analysis

Project impacts related to geology, soils, and paleontological resources were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.7.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on geology, soils, and paleontological resources were evaluated for each of the criteria listed in Table 5.7-6, as discussed in Section 5.7.3.

5.7.4.2 Applicant-Proposed Measures

PG&E will implement the following APMs (refer to Section 5.10, Hydrology and Water Quality, for APMs related to erosion control):

APM GEO-1: Development of Seismic Design Criteria and Appropriate Seismic Safety Design Measures Implementation. The project will be designed based on current seismic design practices and guidelines. As part of design, site-specific seismic analyses will be performed to evaluate peak ground accelerations for design of project components. Because the proposed power cables will be lifeline utilities, the 84^{th} percentile motions (one standard deviation above the median) will be used. Additionally, the Institute of Electrical and Electronics Engineers (IEEE) Standard 693, Recommended Practices for Seismic Design of Substations, has specific requirements to mitigate past substation equipment damage. These design guidelines will be implemented during equipment replacement at substations. Substation equipment will be purchased using the seismic qualification requirements in IEEE 693.

APM GEO-2: Site-Specific Landslide Assessment. As described in Section 5.7.1.4, two proposed structure locations are near active or prehistoric/older slides, with the structures typically located uphill from mapped landslides. A site-specific design-level evaluation of these locations will be performed to evaluate the potential for these landslides to impact project facilities. Appropriate design measures for the protection of the power line structure stability, which may include foundation design enhancements or adjustments to structure locations, will be incorporated into the design.

APM GEO-3: Appropriate Design Measures Implementation. Potentially problematic subsurface conditions during project construction include soft or loose soils that could be susceptible to liquefaction, especially at and in the vicinity of stream or river crossings. Where soft or loose soils are encountered during design studies or construction, appropriate measures will be implemented to avoid, accommodate, replace, or improve soft or loose soils. Such measures may include the following:

- Overexcavating soft or loose soils and replacing them with nonexpansive engineered fill.
- Increasing the density and strength of soft or loose soils through mechanical vibration and compaction.
- Treating soft or loose soils in place with binding or cementing agents.

APM PAL-1: Retain a Qualified Paleontological Principal Investigator. A Paleontological Principal Investigator who meets the standards set forth by the Society of Vertebrate Paleontology will be retained to ensure that all APMs related to paleontological resources are properly implemented during construction. The Paleontological Principal Investigator will have a master's degree or Ph.D. in geology or paleontology, have knowledge of the local paleontology, and be familiar with paleontological procedures and techniques.

APM PAL-2: Worker Environmental Awareness Training. Training on paleontological resources protection will be administered for excavation deeper than 3 feet below ground surface (bgs) at all work locations. Training may be provided by PG&E as a stand-alone training, or it may be included as part of the overall environmental awareness training as required by the project.

The training will include the following:

- The types of fossils that could occur at the project site
- The types of lithologies in which the fossils could be preserved
- The procedures that should be taken in the event of a fossil discovery
- Penalties for disturbing paleontological resources

APM PAL-3: Paleontological Resource Monitoring for Select Construction Activities. A paleontological monitor will be present to monitor for paleontological resources in areas where Siesta Formation (Tst), Orinda Formation (Tor), glauconitic sandstone (Ta), and Pleistocene alluvial and fluvial deposits (Qpaf) occur at the surface and where excavation is greater than 3 feet deep and, for excavations involving drilling or augering, where a drill diameter that is larger than 3 feet will be used. Monitoring is not required if this work occurs in soil or sediment that is imported or previously disturbed. Locations of activities requiring monitoring where previously disturbed or imported soil or sediment is not known are:

- Structure foundation excavation greater than 3 feet bgs using a drill that is 3 feet or greater in diameter at the following locations: RN1, RS1, RS2, RN7, RS7, RN8, RS8, RN21, RS21, TN28, TN29 and TS28.
- Vault installation within Park Boulevard beginning at its intersection with Wellington Street continuing within Park Boulevard Way to the Oakland X Substation property.

The paleontological monitor will be able to: (1) recognize fossils and paleontological deposits and deposits that may be paleontologically sensitive; (2) take accurate and detailed field notes, photographs, and locality coordinates; and (3) document project-related ground-disturbing activities, their locations, and other relevant information, including a photographic record. Monitoring at these locations can be reduced if, after initial monitoring, it is determined the project's Paleontological Principal Investigator that there is a low likelihood of identifying paleontological resources.

APM PAL-4: Unanticipated Paleontological Discovery. If significant paleontological resources are discovered during PG&E's construction activities, the following procedures will be followed:

- Stop work immediately within 100 feet of the fossil find.
- Contact the designated project inspector and PG&E Cultural Resource Specialist (CRS) immediately.
- Protect the site from further impacts, including looting, erosion, or other human or natural damage.
- Arrange for a qualified paleontologist to evaluate the discovery. If the discovery is determined to be significant, PG&E will implement measures to protect and document the paleontological resource. Work may not resume within 100 feet of the find until approved by the paleontologist and CRS.
- Obtain permission from the landowner before treating the fossils. Curate all fossils discovered in an appropriate repository.
- A qualified paleontologist will be notified to review the need for paleontological monitoring during subsequent ground-disturbing activities with the potential to affect paleontologically sensitive sediments at that location. The qualified paleontologist will be responsible for the reassessment of paleontological sensitivity upon the receipt of additional information from ongoing excavations, which may result in reducing or increasing the amount of monitoring required.

5.7.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Less-than-Significant Impact.

For overhead power lines, the flexure capability of the power lines themselves generally can accommodate expected surface fault displacements by bending (sagging) or straightening in response to differential movement between the power line structure locations. Power line structures, however, are susceptible to damage or failure if they directly overlie a fault trace that experiences surface rupture. Site-specific geological studies have been performed at locations where overhead portions of the proposed power lines cross the mapped Hayward Fault zone and intersect individual fault traces (LCI 2024). Power line structures have not been sited above active traces of the fault. In addition, overhead power line spans will be designed to accommodate potential fault displacement between support structures. The project impacts will be less than significant.

ii. Strong seismic ground shaking? *Less-than-Significant Impact*.

As discussed in Section 5.7.1.4, it is likely that the project will be exposed to at least one moderate or greater earthquake located close enough to produce strong ground shaking in the project area. The greatest potential for strong seismic ground shaking within the project area comes from the Hayward Fault, which has produced moderate to large earthquakes during historical time.

Power Lines. Generally, overhead and underground power lines can accommodate strong ground shaking. The proposed project could be subject to strong seismic ground shaking, which can cause shearing and damage to lines, especially underground lines at the point of transition to aboveground. However, the project will be designed and constructed in accordance with applicable industry standards to help protect lines during strong seismic ground shaking. Wind-loading design requirements for overhead lines generally result in greater loading than are those developed to address strong seismic ground shaking, and the project will be incorporating APM GEO-1 to develop seismic design criteria and appropriate safety design measures. In the event that an earthquake produces significant ground motion that affects the project, PG&E will send crews to inspect the lines and repair any damage detected, in accordance with existing practice and procedures. Potential impacts will be less than significant.

Substation Equipment. Some types of substation equipment are susceptible to damage from earthquake shaking. PG&E has reviewed historical substation damage to determine the vulnerabilities of each specific type of equipment. The review included immediate visits to substations following past earthquakes. PG&E personnel were in Los Angeles and Japan reviewing substation damage shortly after the Northridge (1994) and Kobe (1995) earthquakes. Damage has been found to vary dramatically with voltage, with extensive damage to 500 kV substations, significant damage to 230 kV substations, and minor damage to equipment in voltage classifications of 115 kV and lower. The types of equipment most susceptible to damage from strong seismic ground shaking are transformer radiators and bushings, circuit breakers, circuit switchers, and disconnect switches. The project will be incorporating APM GEO-1 to develop seismic design criteria and appropriate safety design measures. Potential impacts will be less than significant.

iii. Seismic-related ground failure, including liquefaction? *Less-than-Significant Impact*.

The project generally is not within a known area of liquefaction hazard; however, localized areas of rated liquefaction potential occur within the project area. These locations include Moraga Substation (highly susceptible), an area immediately adjacent to the northbound (east) side of SR 13 at the overhead lines crossing (low susceptibility), and the westernmost area of the underground alignment within Park Boulevard (low susceptibility). No structural changes will be performed at Moraga Substation, the only location rated as high susceptibility to liquefaction. In addition, the findings of the geotechnical investigation performed for the project indicate that the project alignment and Oakland X Substation are not susceptible to significant liquefaction or related effects (Kleinfelder 2024). Although there is a low probability that conditions conducive to liquefaction will be encountered within the project alignment, the project will implement APM GEO-2, which will minimize liquefaction and associated ground failure hazards such as lateral spreading that could be exacerbated by strong seismic ground shaking. Potential impacts will be less than significant.

iv. Landslides? *Less-than-Significant Impact*.

The project is located within a known landslide hazard area. However, as discussed in Section 5.7.1.4, a project-specific landslide assessment has been performed (LCI 2024). No proposed project facilities, including overhead structures in the overhead portion of the alignment and power lines in the underground portion of the alignment, are located within a mapped landslide area. However, the proposed locations of two structures are above mapped landslides, which could pose a long-term hazard. Additionally, CGS (2003a) mapped a large landslide extending beneath Park Boulevard just east of the intersection with Estates Drive (near milepost 3.9). This slide appears to have been identified based on interpretation of historic aerial imagery and was not confirmed as part of InfraTerra's 2024 assessment. The replacement structures are located east of the slide margin and, therefore, are not considered at risk from the slide if present. Additionally, the proposed deep foundations, including micropiles and caissons, will minimize the potential for impacts from shallow slope failure. Furthermore, the project will incorporate APM GEO-3 to include appropriate design measures for localized soil conditions. Potential impacts will be less than significant.

b) Result in substantial soil erosion or the loss of topsoil? *Less-than-Significant Impact*.

During construction, grading activities will be conducted at specific areas along the PG&E power lines to create temporary work areas or level structure areas. Minimal grading and vegetation clearing may be required for power line structure installation work areas, tension pull site development, and existing access road improvements for the overhead portion of the project alignment. Construction sites will be accessed using existing paved and unpaved access roads. The underground portion of the project alignment, which is in existing paved roads, will be accessed exclusively using existing paved roads.

BMPs will be implemented to minimize and avoid surface runoff, erosion, and pollution and to control dust. Erosion and loss of topsoil during construction of project components will be minimized because of the limited areas that will be graded and disturbed, the temporary nature of construction, and the use of standard BMPs and dust control measures to minimize fugitive dust emissions and stormwater runoff, as described in Section 5.10. The project also will incorporate APM HYD-1 (refer to Section 5.10), which requires development and implementation of a stormwater pollution prevention plan. Potential impacts will be less than significant.

c) Be located on a geologic unit of 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? *Less-than-Significant Impact*.

The overhead portion of the project alignment traverses area with steep slopes and mapped landslide risk. A site-specific study has determined that no structure foundations or underground circuits are located within mapped landslides. Additionally, the proposed deep foundations, including micropiles and caissons, will minimize the potential for impacts from shallow slope failure. APM GEO-2 will be implemented to further assess landslide risk at two structure locations where nearby mapped landslides could potentially migrate toward the structure and pose a long-term risk. Potential impacts associated with landslides will be less than significant.

The project area generally is not located within a known area of liquefaction hazard; however, localized areas of rated liquefaction potential occur within the project area. No new structures or underground duct banks are in areas designated as moderate or high liquefaction hazards based on CGS mapping. Additionally, NRCS does not indicate that any soils of low bearing strength or high collapse potential exist along the project alignment. No geotechnical requirements are needed; however, if unstable soils are identified, PG&E will implement APM GEO-3 and apply appropriate design measures as identified in the geotechnical reports based on soil type. Potential impacts associated with liquefaction will be less than significant.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? *Less-than-Significant Impact.*

Expansive soils contain significant amounts of clay that expands when wet and can cause damage to foundations, such as those for the replacement structures. Based on a review of NRCS soil survey data for the project area, expansive soils were identified in the Contra Costa County portion of the project area (refer to Table 5.7-4). As described in Section 3.3.3.1, replacement foundations in the overhead portion of the alignment will be either a group of micropiles with a pile cap, or a single drilled-shaft reinforced-concrete caisson. In the underground portion of the alignment, a duct bank will be encased in 1.5-foot-thick thermal concrete located a minimum of 3 feet below the road surface. Neither the deep foundations to be used for the aboveground portion of the project nor the duct banks in the underground portion of the project are susceptible to damage from expansion and contraction of shallow soils. Potential impacts will be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? *No Impact.*

The project does not include a waste disposal system; therefore, no impact will occur.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? *Less-than-Significant Impact.*

The project does not occur near or on a unique geologic feature and no impact will occur during project construction or operation and maintenance.

While most of the project is in geological units with very low to low paleontological sensitivity or located where the soil is likely imported or previously disturbed, select project construction activities will result in subsurface disturbance potentially affecting geological units with high paleontological sensitivity and that have high potential to encounter paleontological resources. Excavation activities deeper than 3 feet in four geological units in the project study area have high paleontological sensitivity and have high potential to encounter paleontological resources: Siesta Formation, Orinda Formation, Glauconitic sandstone, and alluvial/fluvial deposits (Pleistocene). Within these four geological units, construction activities that will use a drill diameter of 3 feet or larger and vault excavation could inadvertently unearth and impact unknown (that is, not yet recorded), buried paleontological resources that cannot be identified through desktop review.

Paleontological resources may become pulverized by a small drill bit (less than 3 feet diameter), whereas a large-diameter drill bit (at least 3 feet diameter) may allow paleontological resources to survive intact, and these may be discernible within spoils piles. Typical excavation for structure foundations using drilling or auger will be approximately 3 to approximately 8 feet in diameter and up to approximately 30 feet in depth. The drill bit diameter used will be the size of the excavated hole, for example, a 3-foot diameter drill bit will be used for a 3-foot diameter foundation excavation. During excavation for these larger structure foundations in high paleontological sensitivity areas, the project could inadvertently unearth and destroy unknown (that is, not yet recorded) buried paleontological resources that cannot be identified through noninvasive field surveys.

Construction activities where drilling/augering excavation will occur with a drill less than 3 feet in diameter will not create spoils with discernible paleontological resources because macrofossils are likely to be crushed or damaged and rendered nonrecoverable. Micropile structure foundation installation does not create spoils piles. Removal of existing structure foundation will occur where the soil is likely imported or previously disturbed. Equipment upgrades within the substations will not include ground disturbance. Blading activities and landslide repair on existing dirt access roads will not occur more than 3 feet bgs and will have no impact.

The proposed location of the underground rebuild portion is in a geological unit with high paleontological sensitivity within Park Boulevard between Wellington Street and Park Boulevard Way, and Park Boulevard Way between Park Boulevard and the Oakland X Substation property. Duct bank excavation in these city streets will be where the soil is likely imported or previously disturbed. The excavation, which will be approximately 4 feet wide and approximately 5 feet deep, may extend to approximately 10 feet deep at times. The larger and deeper vault excavations have the potential to occur within native or undisturbed soil. Typical excavation for vaults is expected to be up to approximately 42 feet long, 18 feet wide, and 13 feet deep. Excavation is expected to occur for up to eight vaults (at most approximately 800-1,000 feet apart on a line) in Park Boulevard and Park Boulevard Way between Wellington Street and Oakland X Substation. During excavation for vaults in the high paleontological sensitivity area, the project could inadvertently unearth and destroy unknown (that is, not yet recorded) buried paleontological resources that cannot be identified through noninvasive field surveys.

For construction in the four geological units with high sensitivity in likely undisturbed soil or sediment where approximately 12 power line structures will be installed using a drill diameter larger than 3 feet and where approximately 5-10 underground power line vaults will be installed, PG&E will implement paleontology APMs. APM PAL-1 requires a qualified project paleontologist; APM PAL-2 requires worker awareness training monitoring for all project excavation activities deeper than 3 feet bgs; APM PAL-3 requires monitoring for select construction activities; and APM-4 requires recovery of paleontological resources. The remainder of the proposed the project is within areas having very low to low paleontological sensitivity. APM PAL-2 to APM PAL-4 will be implemented in these areas as deemed necessary by the project paleontologist. Construction impacts will be less than significant.

The operation and maintenance phase activities of the project will not be ground disturbing and, therefore, will not directly or indirectly impact a unique paleontological resource or site or a unique geologic feature; no impact will occur from operation and maintenance.

5.8 Greenhouse Gas Emissions

This section discusses GHG emissions associated with project construction, operation, and maintenance. GHG emissions were calculated and reported in carbon dioxide equivalents (CO_2e) for carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4) emissions from on-road vehicles, off-road equipment, and helicopters, as well as for sulfur hexafluoride (SF_6) emissions from new circuit breakers. The analysis concludes that impacts associated with GHG emissions will be less than significant. The implementation of the APMs described in Section 5.8.4.3, as well as those described in Section 5.3, Air Quality, will further reduce less-than-significant impacts.

The project's potential effects on GHG emissions were evaluated using the criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.8-2 and discussed in more detail in Section 5.8.4.

5.8.1 Methodology and Environmental Setting

5.8.1.1 Methodology

The effect each GHG has on global warming is a combination of the amount of its emissions and its global warming potential (GWP). GWP is a measure of how much energy the emissions of 1 ton of a gas would absorb over a given period of time, relative to the emissions of 1 ton of CO_2. GHG emissions are presented in terms of metric tons (MT) of CO_2e, which is calculated as the product of the mass emitted of a given GHG and its specific GWP. The GHG emissions were calculated using the 100-year GWP values from Table A-1 of Subpart A of 40 CFR Part 98 – Global Warming Potentials.

Short-term construction emissions of GHG were evaluated. Construction emissions of GHG from off-road construction equipment were estimated using the methodologies and emission factors described in the California Emissions Estimator Model (CalEEMod) User's Guide (ICF 2022). On-road vehicle emissions were estimated using the methodologies described in the CalEEMod User's Guide (ICF 2022) and emission factors obtained from the EMFAC2021 emissions model (CARB 2024c). Helicopter emissions were estimated using emission factors obtained from the Swiss Federal Office of Civil Aviation (Rindlisbacher, Theo, and Lucien Chabbey 2015). Projected construction emissions were estimated for each year based on the anticipated project schedule and activities at each of the project construction sites. Although the majority of construction activities are evaluated to occur in 2027, construction emission estimates were developed using equipment and vehicle emission factors for model year 2026, which is the year in which construction was expected to begin. This approach, even with the construction schedule update to begin in 2028, provides for a more conservative emissions estimate as equipment and vehicle emission factors are expected to improve each year based on developments in control technologies and the required use of cleaner equipment and vehicles over time. Detailed construction emission calculations, including the assumptions employed, are presented in Appendix A.

Because the project involves the rebuilding of existing infrastructure, there will be no change to current operation and maintenance activities as a result of this project. However, two new SF_6-insulated circuit breakers will be installed as part of the project. Long-term GHG emissions associated with leakage from these circuit breakers were quantified; the detailed emission calculations, including the assumptions employed, are also presented in Appendix A.

GHG emission calculations in this document were based on worst-case estimates of emissions to ensure presentation of a conservative environmental analysis. This analysis may be revised, as needed, to reflect changes to the project plans.

5.8.1.2 Environmental Setting

GHGs are global concerns, unlike criteria air pollutants or toxic air contaminants that are of regional and local concern. Scientific research indicates that observed climate change is most likely a result of increased GHG emissions associated with human activity (Intergovernmental Panel on Climate Change 2023). Global climate change describes a collection of phenomena, such as increasing temperatures and rising sea levels, occurring across the globe from increasing anthropogenic emissions of GHGs. GHGs contribute to climate change by allowing ultraviolet radiation to enter the atmosphere and warm the Earth's surface, but also prevent some infrared radiation from the Earth from escaping back into space. The largest anthropogenic source of GHGs is the combustion of fossil fuels, which result primarily in CO_2 emissions.

As defined in AB 32, "greenhouse gas" or "greenhouse gases" include, but are not limited to, CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6. California is a substantial contributor to global GHG emissions. In 2021, the annual California statewide GHG emissions were 381.3 million metric tons (MMT) of CO_2e. The transportation sector accounts for approximately 39 percent of the statewide GHG emissions. The industrial and electric power sectors account for approximately 22 percent and 16 percent, respectively, of the total statewide GHG emissions. The dominant GHG emitted is CO_2, primarily from fossil fuel combustion (CARB 2024a).

5.8.1.3 GHG Setting

The BAAQMD, which is the air district with jurisdiction over the project area, has prepared a GHG emissions inventory to analyze GHG emissions produced within the Bay Area that may contribute to climate change. Table 5.8-1 provides an overview of the 2011 Bay Area GHG emissions inventory, which is the most recently updated inventory available.

Table 5.8-1. 2011 Bay Area GHG Emissions Inventory

End-Use Sector	% of Total Emissions	CO2e Emissions (MMT/Year)
Industrial/Commercial	35.7%	31.0
Residential Fuel Usage	7.7%	6.6
Electricity/Co-Generation[a]	14.0%	12.1
Off-Road Equipment	1.5%	1.3
Transportation	39.7%	34.3
Agriculture/Farming	1.5%	1.3
Total	100%	86.6

Source: BAAQMD 2015

[a] Includes imported electricity emissions of 2.7 MMT CO_2e.

As shown in Table 5.8-1, the Bay Area's transportation and industrial/commercial sectors are the two largest contributors of GHG emissions at 39.7 percent and 35.7 percent, respectively. The electric power sector is the next largest contributor of GHG emissions at 14 percent. The total GHG emissions of all end-use sectors is 86.6 MMT of CO_2e per year.

The project will include the installation of two new SF_6-insulated circuit breakers; leakage from these circuit breakers will contribute to project-specific GHG emissions. No other existing infrastructure with potential or known GHG emissions will be upgraded or replaced by the project.

5.8.2 Regulatory Setting

5.8.2.1 Federal

The Supreme Court decision in Massachusetts et al. v. Environmental Protection Agency et al. (Supreme Court Case 05 1120) found that the EPA has the authority to list GHGs as pollutants and to regulate emissions of GHGs under the federal Clean Air Act (CAA). On December 7, 2009, EPA found that CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6 may contribute to air pollution and may endanger public health and welfare (EPA 2024b). In response to this decision, EPA has established reporting regulations that require specific facilities and industries to report their GHG emissions annually and permit their GHG emissions sources.

Because the project is not expected to include the long-term operation of stationary combustion sources, the project will not be subject to federal GHG reporting and permitting regulations.

5.8.2.2 State

In addition to regulating emissions of criteria pollutants and toxic air contaminants, as described in Section 5.3, the California Air Resources Board (CARB) also is responsible for regulating GHG emissions in California. Key laws, policies, and standards through which CARB strives to do so are described in the following subsections.

Executive Order S-3-05

State Executive Order S-3-05, issued in 2005, established GHG reduction targets for the state of California. The targets called for a reduction of GHG emissions to 2000 levels by 2010; a reduction of GHG emissions to 1990 levels by 2020; and a reduction of GHG emissions to 80 percent below 1990 levels by 2050 (Office of the Governor 2005). The California Environmental Protection Agency secretary is required to coordinate development and implementation of strategies to achieve the GHG reduction targets.

Global Warming Solutions Act of 2006

In 2006, the California State Legislature signed the Global Warming Solutions Act of 2006 (AB 32), which provides the framework for regulating GHG emissions in California. This law requires CARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit is 431 MMT of CO_2e (CARB 2024d) and, based on the statewide inventory presented in Section 5.8.1.2, this limit has been successfully achieved.

Because the project is not expected to include the long-term operation of stationary combustion sources, the project will not be subject to CARB's GHG reporting regulations.

Climate Change Scoping Plan

Part of CARB's direction under AB 32 was to develop a scoping plan that contains the main strategies California will use to reduce GHG emissions that cause climate change. The scoping plan includes a range of GHG reduction actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program (CARB 2008). CARB first approved the AB 32 Scoping Plan in 2008 and its latest adopted plan is the 2022 Scoping Plan for Achieving Carbon Neutrality (CARB 2022). The 2022 scoping plan lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045 (CARB 2022). This path includes strategies for reducing California's dependency on petroleum (for example, electrifying the transportation sector) and minimizing the use of chemicals and refrigerants with high GWPs (CARB 2022).

Interim CEQA Significance Thresholds

CARB published a Preliminary Draft Staff Proposal titled Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA in October 2008 that included a proposal that non-transportation-related sources with GHG emissions less than 7,000 metric tons of CO_2e per year should be presumed to have a less-than-significant impact.

CEQA Guidelines

On December 30, 2009, the California Resources Agency adopted amendments to the CEQA guidelines to include analysis of GHG emissions in CEQA documents, deferring significance thresholds to the lead agency. The amendments became effective on March 18, 2010.

Regulation for Reducing SF_6 Emissions

A Regulation for Reducing SF_6 Emissions from Gas Insulated Switchgear was implemented in 2011 as part of AB 32, mandating utility-wide reduction of SF_6 emissions to a 1 percent leak rate by 2020. Effective January 1, 2022, this regulation was revised with the intent of phasing out the use of new SF_6-insulated equipment by 2033 and reducing GHG emissions from equipment using other insulating gases. Additionally, allowable annual emissions from gas-insulated equipment would vary with the reporting entity's equipment capacity rather than an absolute limit (CARB 2024b). The Applicant will be subject to annual reporting under this regulation as the owner of gas-insulated equipment that uses covered insulating gas (such as SF_6).

Executive Order B-30-15

In April 2015, Governor Brown signed Executive Order B-30-15 that added the intermediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030.

Senate Bill 32 and Assembly Bill 197

On September 8, 2016, Governor Brown signed SB 32 and AB 197, which codified the 2030 GHG emissions reduction target of 40 percent below 1990 levels and provided additional direction for updating the scoping plan. The 2017 Scoping Plan established a path that would get California to its 2030 target, which is reiterated and expanded upon in the 2022 update.

Short-Lived Climate Pollutant Reduction Strategy

To best support the reduction of GHG emissions consistent with AB 32, CARB published the Short-Lived Climate Pollutant Reduction Strategy in March 2017. This plan, developed pursuant to SB 605 and SB 1383, establishes targets for statewide reductions in short-lived climate pollutant emissions of 40 percent below 2013 levels by 2030 for CH_4 and hydrofluorocarbons and 50 percent below 2013 levels by 2030 for anthropogenic black carbon. This strategy was integrated into the 2022 version of the scoping plan described previously (CARB 2024f).

5.8.2.3 Regional

The project stretches from Contra Costa County to Alameda County, both of which are located within the SFBAAB and under the jurisdiction of the BAAQMD. BAAQMD is the agency charged with preparing, adopting, and implementing emission control measures and standards for mobile, stationary, and area sources of air pollution in the SFBAAB.

BAAQMD's permitting regulations specifically target GHG emissions from facilities that are classified as a Prevention of Significant Deterioration (PSD) source under 40 CFR Part 52. Because the project is not expected to include the long-term operation of stationary combustion sources, it is not expected to be classified as a PSD source. Therefore, climate plans and guidance documents published by BAAQMD and other regional organizations were instead reviewed for relevancy to the project, as summarized in the following sections.

Local air districts act under state law and their discretionary requirements apply to PG&E utility projects, as applicable.

Clean Air Plans

Under the California CAA, which was approved in 1988 and amended in 1992, BAAQMD is required to develop an air quality plan to achieve and maintain compliance with federal and state non-attainment criteria pollutants within the air district. In response, BAAQMD has developed plans to achieve and maintain compliance with the federal ozone standards. The most recent of these plans is the 2017 Bay Area Clean Air Plan, adopted in April 2017, which provides a regional strategy to protect public health and the climate through a wide range of control measures designed to decrease emissions of particulate matter, ozone, toxic air contaminants, and GHGs. These emission reductions will be achieved primarily through the reduction of fossil fuel combustion, but also through minimization of CH_4 leaks, improved building energy efficiency, and the promotion and advancement of clean vehicles (BAAQMD 2017a; BAAQMD 2024).

BAAQMD CEQA Guidelines

BAAQMD adopted CEQA Guidelines in December 1999 to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality (BAAQMD 1999). BAAQMD updated its CEQA Guidelines in June 2010 to reference its newly adopted thresholds of significance. These thresholds of significance were challenged in court but were ultimately upheld by the California Supreme Court. BAAQMD published a revised version of its CEQA Guidelines in May 2017 (BAAQMD 2017b) and again in April 2023, following 2022 updates to its CEQA significance thresholds for climate impacts from land use projects (housing and commercial [offsite and retail] uses) and plans (BAAQMD 2023; BAAQMD 2022). Because this project will include GHG emissions from vehicle miles traveled but not permitted stationary combustion sources, only the land use significance thresholds will apply (BAAQMD 2023). Lead agencies may, at their discretion, use BAAQMD's current thresholds of significance to help inform environmental review for development projects in the Bay Area and the current BAAQMD CEQA Guidelines for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures (BAAQMD 2023; BAAQMD 2022).

GHG Reduction Exchange

The California Air Pollution Control Officers Association (CAPCOA) has established the Greenhouse Gas Reduction Exchange (GHG Rx) for GHG emission credits in California. Credits listed on the GHG Rx come from voluntary emission reduction projects and can be purchased to offset GHG emissions.

Bay Area 2050 Plan

The Bay Area 2050 Plan is a 30-year plan that comprises 35 strategies to reduce GHG emissions from cars and light-duty vehicles by better connecting housing, the economy, transportation, and the environment across the Bay Area's nine counties – Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. This plan was developed by the Bay Area's two regional planning agencies, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (MTC 2024). While most strategies do not apply to this project, the project will not conflict with any of the plan's strategies.

5.8.2.4 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and CUPAs with respect to air quality and hazardous waste regulations. However, plans and policies for the City of Orinda, City of Piedmont, City of Oakland, and Contra Costa County are considered for informational purposes and to assist with the CEQA review process, based on the expected location of project construction activities.

The City of Orinda released its Vulnerability Assessment in 2023 that discussed climate change trends (City of Orinda 2023). This plan also identified energy delivery as one of the key services most vulnerable to climate change based, in large part, on power lines passing through areas of very high wildfire risk, elevated landslide risks, and locations subject to severe weather and high winds – all conditions which may be exacerbated by climate change. With this Vulnerability Assessment, the City of Orinda will be able to identify opportunities for minimizing risk to these vulnerable services in the future (City of Orinda 2023).

The Contra Costa County Climate Action Plan was adopted in 2015. The Climate Action Plan included a goal to reduce community-wide emissions 15 percent below 2005 levels by 2020, consistent with AB 32, and established a 2035 target of approximately 57 percent reduction below 2005 levels, based on the Executive Order B-30-15 target for 2030 (Contra Costa County 2015). The County intends to update the Climate Action Plan to include a target reduction of 80 percent below 1990 levels by 2050, in accordance with the state's adopted GHG emissions reduction targets (Contra Costa County 2024).

The City of Piedmont released its Climate Action Plan 2.0 in March 2018 that quantified the City's GHG emissions and established residential and governmental priorities to reduce the City's three largest sources of GHG emissions (City of Piedmont 2024). The Climate Action Plan 2.0 also includes several specific objectives to support state and local GHG emission reduction goals. Some of these objectives include increasing renewable energy consumption to 100 percent, reducing the risks of extreme heat, and reducing the risks of damage from extreme weather events (City of Piedmont 2024).

The City of Oakland released its 2030 Equitable Climate Action Plan in July 2020 that quantified the City's GHG emissions and established action steps toward achieving the local emissions reduction target of 56 percent relative to 2005 levels (City of Oakland 2024). The City of Oakland also adopted a 2045 Carbon Neutrality Goal, calling for a dramatic reduction in Oakland's GHG emissions and "deep decarbonization" of the building and transportation sectors by 2045. This follows the previous reduction target of 36 percent by 2020 (City of Oakland 2024).

5.8.3 Impact Questions

5.8.3.1 Impact Questions

The project's potential effects related to GHG emissions were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.8-2 and discussed in more detail in Section 5.8.4.

Table 5.8-2. CEQA Checklist for Greenhouse Gas Emissions

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

5.8.3.2 Additional CEQA Impact Questions

None.

5.8.4 Potential Impact Analysis

Project impacts related to GHG emissions were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.8.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. CEQA allows for significance criteria established by the applicable air pollution control district(s) to be used to assess the impact of a project related to GHG emissions, at the discretion of the CEQA Lead Agency.

Because BAAQMD does not provide a construction-related significance threshold for GHGs, an approach developed by the South Coast Air Quality Management District (SCAQMD) often is referenced. For construction-related GHGs, SCAQMD recommends that total emissions from construction be amortized over 30 years and added to operational emissions for comparison to the operation-based significance threshold of 10,000 MT of CO_2e per year (SCAQMD 2008). This approach will be used to evaluate the project's construction-related GHG emissions in lieu of CARB's interim significance threshold because CARB's threshold is intended for non-transportation-related emission sources, of which there are expected to be very few during project construction.

BAAQMD has developed operational GHG thresholds based on a project's effect on California's efforts to meet the state's long-term climate goals. If a project would contribute its "fair share" of what will be required to achieve those long-term climate goals, then a reviewing agency can find that the impact will not be significant because the project will help to solve the problem of global climate change. Applying this approach, the BAAQMD has analyzed what will be required of new land use development projects to achieve California's long-term climate goal of carbon neutrality by 2045. BAAQMD has found, based on this analysis, that a new land use development project being built today must incorporate one of the following design elements (A or B) to do its "fair share" toward implementing the goal of carbon neutrality by 2045 (BAAQMD 2023). The full text of the design elements is presented in the following outline. As discussed in Section 5.8.4.3, this project will satisfy element B. Per Appendix G of the CEQA Guidelines, the potential significance of the project's GHG emissions also were evaluated for each of the criteria listed in Table 5.8-2, as discussed in Section 5.8.4.3.

A. Projects must include, at a minimum, the following project design elements:

1. Buildings
   a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
   b. The project will not result in any wasteful, inefficient, or unnecessary energy use as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the state CEQA Guidelines.
2. Transportation
   c. The project will achieve a reduction in project-generated VMT below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted SB 743 VMT target that reflects the recommendations provided in the Governor's Office of Planning and Research's *Technical Advisory: Evaluating Transportation Impacts in CEQA*:

i. Residential projects: 15 percent below the existing VMT per capita
ii. Office projects: 15 percent below the existing VMT per employee
iii. Retail projects: no net increase in existing VMT

d. The project will achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

B. Projects must be consistent with a local GHG reduction strategy that meets the criteria under state CEQA Guidelines Section 15183.5(b).

5.8.4.2 Applicant-Proposed Measures

The project will have less-than-significant impacts on GHG emissions. Implementation of APM GHG-1 and APM GHG-2, will further minimize potential impacts.

APM GHG-1: PG&E Minimize GHG Emissions.

PG&E will implement the following to minimize GHG emissions consistent with the recommendations provided in the CPUC's Draft Environmental Measure:

- If suitable park-and-ride facilities are available in the project vicinity, construction workers shall be encouraged to carpool to the job site.
- The Applicant shall develop a carpool program to the job site.
- On-road and off-road vehicle tire pressures shall be maintained to manufacturer specifications. Tires shall be checked and re-inflated at regular intervals.
- Demolition debris shall be recycled for reuse to the extent feasible.
- The contractor shall use line power instead of diesel generators at all construction sites where line power is available.
- The contractor shall maintain construction equipment per manufacturing specifications.
- Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time will depend on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction supervisors will include briefings to crews on vehicle use as part of preconstruction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use.

APM GHG-2: PG&E Minimize SF_6 Emissions.

PG&E will implement the following to minimize SF_6 emissions:

- Incorporate Moraga Substation modifications into PG&E's systemwide SF_6 emission reduction program. Since 1998, PG&E has implemented a programmatic plan to inventory, track, and recycle SF_6 inputs, and inventory and monitor systemwide SF_6 leakage rates to facilitate timely replacement of leaking breakers. PG&E has improved its leak detection procedures and increased awareness of SF_6 issues within the company. X-ray technology is now used to inspect internal circuit breaker components to eliminate dismantling of breakers, reducing SF_6 handling and accidental releases. As an active member of EPA's SF_6 Emission Reduction Partnership for Electrical Power Systems, PG&E has focused on reducing SF_6 emissions from its transmission and distribution operations and has reduced the SF_6 leak rate by 89 percent and absolute SF_6 emissions by 83 percent.

- Require that new breakers at Moraga Substation, as applicable, have a manufacturer's guaranteed maximum leakage rate of 0.5 percent per year or less for SF_6.
- Maintain substation breakers in accordance with PG&E's maintenance standards.
- Comply with CARB Early Action Measures as the policies become effective.

5.8.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

Potential project impacts related to GHG emissions were evaluated against the CEQA significance criteria and are discussed in further detail in the following paragraphs. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase. In accordance with recent CPUC precedent, this analysis follows the SCAQMD's recommended approach for construction emissions by amortizing the construction emissions over a 30-year project lifetime, adding them to the operation and maintenance emissions, and then comparing those emissions to the significance threshold of 10,000 metric tons CO_2e per year.

b) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? *Less-than-Significant Impact*.

Construction of the project will generate GHG emissions over the estimated 43-month construction period resulting from off-road construction equipment and machinery, helicopter activity, vehicular traffic generated by construction workers, and material hauling and disposal. Following project completion, all construction emissions will cease. As shown in Table 5.8-3, approximately 3,519 MT of CO_2e could be generated during PG&E's 43-month construction period. Amortized over 30 years, the estimated PG&E GHG construction emissions are 117 MT of CO_2e per year.

Table 5.8-3. Estimated Construction-Related Greenhouse Gas Emissions

Construction Year	Emissions (MT CO_2e/Year)
Total GHG Emissions (Year 2026)	436
Total GHG Emissions (Year 2027)	2,471
Total GHG Emissions (Year 2028)	608
Total GHG Emissions (Year 2029)	4.45
Total GHG Emissions (Year 2030)	0.72
Total GHG Emissions Over 43 Months	3,519
Total GHG Emissions Amortized over 30 years	117

Because the project involves the rebuilding of existing infrastructure, no change to current operation and maintenance activities is expected. However, with installation of two new SF_6-insulated circuit breakers, the project will have an increase in operational GHG emissions resulting from potential SF_6 leakage. As detailed in Appendix A, the increase in the project's operational GHG emissions is expected to be approximately 14 MT of CO_2e per year, based on a presumed annual leakage rate of 0.5 percent, consistent with APM GHG-2, and an SF_6 capacity per breaker of 132 pounds. The project's annual GHG emissions, including the amortized construction emissions and the annual increase in operation emissions, will be 131 MT CO_2e per year, which is lower than the SCAQMD's significance threshold of 10,000 MT CO_2e per year. Reduction in GHG emissions associated with implementation of APM GHG-1 may further reduce the project's construction-related GHG emissions, but this potential reduction is not quantifiable and is not included in the emission estimates. Based on the previous discussion, the impact will be less than significant.

Regarding the project's unpermitted operational sources of GHG emissions, the project demonstrates compliance with BAAQMD's GHG-related land use thresholds of significance by being consistent with a local GHG reduction strategy. Specifically, the project will support efforts within the City of Orinda to reduce the risk of infrastructure vulnerability that may be exacerbated by climate change while continuing secure delivery of renewable energy through PG&E's existing power mix. The project's replacement of four existing power line structures in an area of very high wildfire risk in Orinda is modeled to reduce the risk of wildfire at that location by approximately 62 percent (refer to Table 5.20-2).

Per BAAQMD's CEQA Guidelines, projects that incorporate applicable elements of a local GHG reduction strategy, such as the City of Orinda's Vulnerability Assessment, will have a less-than-significant impact on climate change (BAAQMD 2023).

c) Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? No Impact.

The project will not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. The minimal short-term construction GHG emissions will not interfere with the long-term goal of SB 32 to reduce GHG emissions to 40 percent below 1990 levels by 2030. Additionally, as described in Section 5.3, Air Quality, compliance with applicable airborne toxic control measures will ensure construction equipment and vehicles are operated and maintained in an efficient manner with the added benefit of reducing already minimal GHG emissions consistent with the control strategies of the Bay Area Clean Air Plan. Therefore, project construction will not conflict with plans, policies, or regulations intended to reduce GHGs and no impact will occur.

GHG emissions from operation and maintenance of the project will not change as a result of the addition of the approximately 1.2-mile underground rebuild and the approximately 1.2-mile reduction in overhead power lines. A minimal increase is expected with the replacement of one oil-insulated circuit breaker and one SF_6-insulated circuit breakers with two new SF_6-insulated circuit breakers at Moraga Substation to align with the replacement line's higher rating capacity. PG&E will implement APM GHG-2 to minimize this increase in operational GHG emissions. Operation and maintenance of the new and modified facilities is assumed to be incorporated into existing PG&E activities with only minor adjustment, such that GHG emissions from operation and maintenance activities are anticipated to only minimally increase as a result of this project. Additionally, electrification of day-to-day operations in land use development projects and industrial processes is a method that potentially can reduce fossil fuel (including gasoline or diesel) combustion because of the use of a less carbon-intensive energy source (depending on the source of electricity production). By increasing reliability of the project area's power system, existing electricity customers will continue to have access to safe and reliable electricity. This reliable electricity source may then support additional electrification of customer operations, which in turn may result in reduced GHG emissions. In addition, the project will improve the electric transmission infrastructure in the region, which can support existing or future renewable electric generation (for example, wind, solar, hydro, and thermal). Therefore, the project will be consistent with the goals of the AB 32 Scoping Plan and promote achievement of the energy efficiency and renewable energy targets of SB 350 and SB 100. Therefore, no impact will occur.

5.8.4.4 CPUC Draft Environmental Measures

CPUC Draft Environmental Measure *Greenhouse Gas Emissions Reduction During Construction* incorporated into APM GHG-1.

5.9 Hazards, Hazardous Materials, and Public Safety

This section describes existing conditions and potential impacts related to hazards, hazardous materials, and public safety associated with construction, operation, and maintenance of the project. The analysis concludes that any impacts related to hazards, hazardous materials, and public safety will be less than significant; the implementation of APMs described in Section 5.9.4.3 will further reduce less-than-significant impacts. The project's potential effects associated with hazards, hazardous materials, and public safety were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.9-4 and Table 5.9-5 and discussed in more detail in Section 5.9.4. The Environmental Data Resources, Inc. (EDR) report for hazardous sites and wells reported near the project areas and FAA Determinations are provided in Appendix F1 and Appendix F2, respectively.

5.9.1 Methodology and Environmental Setting

5.9.1.1 Methodology

Potential impacts on the environment related to hazards, hazardous materials, and public safety were evaluated based on the type and location of anticipated project-related construction and operational activities. The evaluation was based on review of publicly available information about existing land uses, airports, wildfire hazard zones, and known soil and groundwater contamination sites within and near the substations and the project alignment. Information on hazards, hazards materials, and public safety in the project area was obtained from published studies prepared by state, county, and local agencies, including the following:

- City of Orinda General Plan (City of Orinda 1987)
- East Bay Regional Park District Master Plan (EBRPD 2013)
- Contra Costa County General Plan (Contra Costa County 2005)
- City of Oakland General Plan (City of Oakland 2023)
- Oakland Unified School District 2023-24 Schools Directory (Oakland Unified School District 2023)
- City of Piedmont General Plan (City of Piedmont 2020)

A report summarizing regulatory agency database listings was obtained from EDR and reviewed to screen for nearby hazardous sites and Recognized Environmental Conditions (RECs) that may exist within the project area (EDR 2024). The American Society for Testing and Materials International (ASTM International) standard for Phase I Site Assessment Process E-1527-21 identifies RECs as "(1) the presence of hazardous substances or petroleum products due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products due to a likely release to the environment; or (3) the presence of hazardous substances or petroleum products under conditions that pose a material threat of a future release to the environment." The EDR report (EDR 2024) includes (1) information on sites within 0.25 mile of the project area that were identified in federal, state, and local databases related to the use, storage, or release of hazardous materials and wastes; and (2) a map showing the locations of these sites. The database search process reviews multiple lists for properties with active or historical documented hazardous materials releases and businesses that use, generate, or dispose of hazardous materials or petroleum products in their operation. In addition, the EDR search reviews lists of active contaminated sites that are currently undergoing monitoring and remediation.

As specified by CEQA significance criterion d) (refer to Table 5.9-4), the EDR report was used to identify sites along the project area that are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 ("Cortese List"). Because the Cortese List is no longer specifically updated by the state, those requesting a copy of the Cortese List are now referred directly to the appropriate information resources contained on the Internet websites of the boards or departments that are referenced in the statute. The EDR report's listing of regulated sites was supplemented by reviewing sites listed on the California Department of Toxic Substances Control (DTSC) EnviroStor website and the SWRCB GeoTracker website (DTSC 2024; SWRCB 2024). The EDR report was also used to screen for nearby hazardous waste sites that could potentially affect the project based on the significance criteria summarized in Table 5.9-4. A copy of the EDR report is provided as Appendix F1.

The potential for activities and equipment that could pose fire hazards was evaluated through review of state fire hazard maps, including the California Department of Forestry and Fire Protection (CAL FIRE) (CAL FIRE 2008, 2009, 2023) and the CPUC Fire-Threat Map (CPUC 2022).

5.9.1.2 Environmental Setting

The project is located within the City of Orinda, unincorporated areas of Contra Costa County, and the cities of Oakland and Piedmont. The proposed project will replace in kind approximately 4 miles of overhead power lines and underground approximately 1 mile of power lines between Moraga Substation within the City of Orinda and Oakland X Substation in the City of Oakland. The existing power lines will be upgraded by replacing most of existing towers and poles, replacing all conductors, and installing underground and telecommunication components. The equipment within the substations where the lines terminate will be upgraded to accommodate the conductor upgrades. The existing land uses in the project area include utility, open space, residential, parks, churches and schools, and some commercial land.

5.9.1.3 Airports

In Contra Costa County, the nearest aviation facility is Sandhill Heliport (81CL) in Orinda, located approximately 5 miles north of the project. No land use plan associated with Sandhill Heliport was identified.

The nearest airports in Alameda County to the project site are Oakland International Airport (OAK), approximately 5.5 miles to the south, and Hayward Executive Airport (HWD), approximately 10 miles to the southeast. Alameda County Community Development Agency (ACCDA) has prepared land use compatibility plans for both OAK and HWD (ACCDA 2010, 2012).

OAK, initially constructed in 1927, is a primary commercial service airport owned and operated by the Port of Oakland, providing commercial passenger, general aviation, and cargo services. In 2019, OAK accommodated approximately 13.4 million passengers annually and approximately 242,000 total aircraft operations (takeoffs and landings) by passenger airlines, cargo airlines, general aviation aircraft, and military (Port of Oakland 2023). The project site is outside the OAK Airport Influence Area (AIA) (ACCDA 2010).

HWD was constructed in 1942 as an army airfield; the City of Hayward assumed operational control in 1947. The airport provides general aviation services. In 2019, the airport had a total of 116,753 aircraft operations (FAA 2023). The project site is located outside the Hayward Executive Airport AIA (ACCDA 2012).

5.9.1.4 Wildland Fire Hazards

As described in Section 5.20.2, the CAL FIRE fire hazard severity zone (FHSZ) maps identify federal responsibility areas (FRAs), state responsibility areas (SRAs), or local responsibility areas (LRAs) for preventing or suppressing fires. Within SRAs, the Director of CAL FIRE has designated areas as moderate, high, and very high FHSZs based on factors such as potential fuel sources, terrain, weather, fire behavior characteristics, burn probabilities, and the likelihood of vegetation exposure. Within LRAs, CAL FIRE has recommended the locations of very high FHSZs that may or may not be adopted by local governing agencies. The CAL FIRE maps also show FRAs and fire hazard designations within those federal areas.

Of the approximately 5-mile project alignment, approximately 1.2 miles in Contra Costa County falls within the SRA very high FHSZ designation. In the central and eastern portions of the project alignment, approximately 2.4 miles of the overhead and 0.4 mile of the underground alignment fall within the LRA very high FHSZ designation (CAL FIRE 2023a). Refer to Figure 5.20-1 in Section 5.20, Wildfire. The remainder of the alignment, at the east and west ends, is in areas with no CAL FIRE designation.

The CPUC has adopted fire hazard mapping most recently with its High Fire-Threat Map in 2021, which designates fire-threat areas that require enhanced fire safety. CPUC defines Zone 1 as the Tier 1 High-Hazard Zones from the U.S. Forest Service and CAL FIRE joint map of Tree Mortality High-Hazard Zones. Tier 2 identifies areas with an elevated risk of wildfire associated with overhead utility power lines or overhead utility power line facilities also supporting communication facilities. Tier 3 identifies areas where there is an extreme risk from wildfires associated with overhead utility power lines or overhead utility power line facilities also supporting communication facilities (CPUC 2022). Approximately 1 mile of the project alignment is within a Tier 2 HFTD, and approximately 3 miles of the alignment is within a Tier 3 HFTD (CPUC 2022). Refer to Figure 5.20-2 in Section 5.20, Wildfire.

Additional information regarding wildland fires and risks is presented in Section 5.20, Wildfire. Fire protection services and equipment near the project alignment are discussed in Section 5.15, Public Services.

5.9.1.5 Metallic Objects

No metallic pipelines or cables within 25 feet of the project have been identified that will create a hazard, hazardous materials, or a public safety issue.

5.9.1.6 Schools

There are 17 schools within approximately 0.25 mile of the project (refer to Table 5.15-2), with one school located in Orinda, 15 located in Oakland, and one located in Piedmont.

5.9.1.7 Existing Hazardous Materials and Sites

As noted in the introduction to Section 5.9, an EDR report was obtained for the project for a 0.25-mile buffer of the rebuilt project site; the buffer includes all areas of potential ground disturbance (EDR 2024). The EDR report, included in Appendix F1 to this PEA, identified multiple sites that are listed in regulatory agency databases based on past or current hazardous materials use, hazardous waste generation, spills of hazardous chemicals, or the presence of petroleum hydrocarbon tanks, including both current and former tanks, aboveground and underground tanks, and tanks with and without reported releases to the environment. No DTSC-regulated sites were identified within the 0.25 mile buffer. Four RWQCB-regulated sites are listed in the EDR report; further review was performed of information contained in the SWRCB GeoTracker database. This review was focused on those sites within 500 feet of project locations where planned construction activities include ground excavation, either for the replacement of existing power line structures or the installation of underground power lines, because these sites are considered to have the most potential for impacting the project.

The EDR report lists one open RWQCB Leaking Underground Storage Tank (LUST) site that is located within 0.25 mile of the rebuilt project site; however, this site is not located within 500 feet of locations where excavation will occur. Nine LUST sites that have undergone regulatory closure were identified within the 0.25-mile buffer, four of which are located within 500 feet of project excavation areas[25].

The EDR report lists two open RWQCB Cleanup Program Sites (CPS) that are located within 0.25 mile of the rebuilt project site; neither CPS is located within 500 feet of project excavation areas. One closed CPS is located within 0.25 mile of the rebuilt project site, but this site is not located within 500 feet of project excavation areas[25].

There are 10 Cortese List sites located within 0.25 mile of the rebuilt project site. These sites also are listed as LUST sites. Four of the LUST sites are located within 500 feet of the project excavation areas, as discussed in greater detail in the following paragraphs.

[25] An additional closed CPS site mapped within 0.25 mile of the rebuilt project site in the EDR report (site 1280) was determined to be mis-mapped based on information in the GeoTracker database and is located more than 2 miles from the rebuilt project.

No Superfund sites are located within 0.25 mile of the rebuilt project site.

The EDR report lists eight facilities that fall under the Resource Conservation and Recovery Act (RCRA) of 1976 Hazardous Waste Program and are identified as small quantity generators (SQG) or large quantity generators (LQG) of hazardous waste. These sites are located within 0.25 mile of the rebuilt project site and are presented in Table 5.9-1. Five of the eight sites are located within 500 feet of project excavation areas, including three of the sites located on Park Boulevard, one site on 13th Avenue, and Moraga Substation.

Table 5.9-1. RCRA Hazardous Waste Program Facilities within 0.25 Mile of the Rebuilt Project Site

Site	Address	RCRA Status
Site HV1572[a] PG&E Moraga Substation	140 Valley View Drive, Orinda	RCRA-SQG
Site FR1303[b] Daniel Ingram	1091 Brookwood Road, Oakland	RCRA-SQG
Site KA1751[b] Montera Middle School	5555 Ascot Drive, Oakland	RCRA-SQG
Site J44[a] Alpine Cleaners	3800 Park Boulevard, Oakland	RCRA-SQG
Site BI373[a] Edna Brewer Middle School	3748 13th Avenue, Oakland	RCRA-SQG
Site Z194[a] PG&E Oakland X Substation[a]	3729 Park Boulevard, Oakland	RCRA-SQG
Site CK621[a] Federal Bldg Co E Bay Renaissance	3630 Park Boulevard, Oakland	RCRA-SQG
Site CK689[b] Service Station – SAP 135689	3600 Park Boulevard, Oakland	RCRA-LQG

Source: EDR 2024

[a] Site is located within 500 feet of project excavation areas.

[b] Site is located greater than 500 feet from project excavation areas.

Of the sites located within 500 feet of project excavation, those that are both identified as historical RECs[26] and are included within the SWRCB's GeoTracker database are shown on Figure 5.9-1 and described in the following list. No RWQCB regulated sites with an active or inactive status are located in the direct vicinity of project excavation areas. In addition, no DTSC regulated sites are located within 0.25 mile of the rebuilt project site.

City of Oakland Corporation Yard, 5921 Shepherd Canyon Road, Oakland (site AR270 on Figure 5.9-1; information from SWRCB 2024). This site, located on the north side of Shepherd Canyon Road, is listed in the GeoTracker database as a LUST site (ID T0600100469). A release of petroleum hydrocarbons caused by underground storage tank (UST) overfilling and a dispenser pipe leak was reported. One 2,000-gallon gasoline UST, one 550-gallon diesel UST, and associated pipelines were removed in 1990. Two additional USTs with unknown contents were permitted for removal but were not located. Investigations consisted of a soil investigation in 1990 and a soil and groundwater investigation in 1999. Petroleum hydrocarbons were detected in soil below the former tanks in 1990. Petroleum hydrocarbon constituents sampled in a monitoring well near the former gasoline UST exceeded RWQCB environmental screening levels (ESLs) in 1999 but significantly declined by 2011. Sampling downgradient

[26] A historical REC is a previous release of hazardous substances or petroleum products affecting a subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities that meets unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the subject property to any controls (for example, activity and use limitations or other property use limitations) (ASTM International 2021).

of the UST pits in 2011 indicated trace or undetectable levels of total petroleum hydrocarbons in soil and no detections in groundwater. The case was closed in October 2014 under oversight of the Alameda County Department of Environmental Health (ACDEH) consistent with the SWRCB Low-Threat Underground Storage Tank Case Closure Policy. Site management requirements limit future land use to the current commercial land use because of potential vapor intrusion to indoor air in any future residential buildings, and the ACDEH will reevaluate the case if any redevelopment occurs. Any excavation or construction activities in areas of residual contamination require appropriate worker health and safety procedures. The site continues to operate as a City of Oakland corporation yard. The area of former USTs and residual contamination is located more than 240 feet southeast, or downgradient, of the nearest overhead power line structure to be replaced.

Chevron #9-3415, 4500 Park Boulevard, Oakland (site O87 on Figure 5.9-1; information from SWRCB 2024). This site, located on the south side of Park Boulevard to the southeast of the planned underground power lines, is listed in the GeoTracker database as a LUST site (ID T0600102247). The site has historically operated as a gasoline station since at least 1933. One 1,000-gallon waste oil UST and product lines from three gasoline USTs were removed in 1994 and 275 cubic yards of soil were removed at an undocumented date and disposed of offsite. Soil investigations were conducted in 1994, 1995, and 2000, and groundwater was not encountered to 30 feet below ground surface (bgs). The case was closed in February 2002 under oversight of the ACDEH. Residual soil contamination measured in 1994 and 1995 included petroleum hydrocarbon constituents, tetrachloroethene (PCE), and 1,1,1-trichloroethane. The closure document requires a site safety plan for construction workers if excavation or trenching is proposed in the vicinity of residual soil and groundwater contamination at the site. Chevron conducted a subsequent Baseline Site Assessment in 2006 prior to sale of the property. The investigation findings were consistent with previously reported residual concentrations and were below applicable action levels for petroleum hydrocarbon constituents and PCE. The site continues to operate as a gasoline station and auto repair shop. The area of the former UST and residual contamination is located approximately 100 feet southwest, or cross-gradient, of the nearest planned excavation area along the underground power line route.

Desert Petroleum/J & M Service Station #793, 4035 Park Boulevard, Oakland (site H59 on Figure 5.9-1; information from SWRCB 2024). This site, located on the north side of Park Boulevard to the northwest of the planned underground power lines, is listed in the GeoTracker database as a LUST site (ID T0600100158) and Non-Case Information Site (ID T10000020783). At this former gasoline station, LUSTs impacted soil, groundwater, and soil vapor. One 8,000-gallon gasoline UST, one 10,000-gallon gasoline UST, one 6,000-gallon gasoline UST, one 500-gallon waste oil UST, and one 200-gallon waste oil UST were removed in 1994 and 1995. Site investigations and cleanup were overseen by the San Francisco Bay RWQCB. During site cleanup and remediation, 15 groundwater monitoring wells were installed, and USTs and associated piping, 1,866 cubic yards of impacted soils, and 2.3 million gallons of impacted groundwater were removed and hauled offsite. The case was closed in January 2015 under the SWRCB Low-Threat Underground Storage Tank Case Closure Policy. Residual contamination is present in soil 14 feet bgs. A subsurface investigation was conducted in 2022 to assess residual contamination prior to residential redevelopment. Volatile fuel constituents were not detected above corresponding SWRCB Low-Threat Underground Storage Tank Case Closure Policy screening levels or San Francisco Bay RWQCB human health risk levels (HHRLs) for residential vapor intrusion. PCE was detected in one soil vapor sample below the corresponding RWQCB HHRL for residential vapor intrusion. Chlorinated solvents were not detected in groundwater, present at approximately 30 feet bgs. The RWQCB has determined that the site is suitable for residential reuse. The area of the former USTs and residual contamination is located approximately 50 feet northeast, or cross-gradient, of the nearest planned excavation area along the underground power line route.

Private Residence, 3761 block of Park Boulevard Way, Oakland (site T10000000818 on Figure 5.9-1; information from SWRCB 2024). This site, located on the northeast side of Park Boulevard Way to the northeast of the planned underground power lines, is listed in the GeoTracker database as a LUST site (ID T10000000818). The site was formerly occupied by a gas station from approximately 1950 to 1970. Records indicate that one unspecified fuel UST of unknown size and associated piping were removed in approximately 1970. A soil and grab groundwater investigation was conducted in 2008, and a soil, soil vapor, and grab groundwater investigation was conducted in 2009. Groundwater was found at 50 to 60 feet bgs. Soil and groundwater were impacted by residual petroleum hydrocarbons in the vicinity of the former UST, but no volatile organic compounds were detected in soil vapor. The residual contamination was not considered to pose a significant threat to water resources, public health and safety, or the environment, and was expected to decrease over time as a result of biodegradation and natural attenuation processes. The case was closed in August 2009 under oversight of the ACDEH. The site is currently developed as a multi-tenant apartment complex. The area of the former UST and residual contamination is located approximately 100 feet southeast, or upgradient, of the nearest planned excavation area along the underground power line route.

The EDR report identified nine spill incidents listed on the California Hazardous Material Incident Reporting System database that were located within 500 feet of project excavation (EDR 2024). Seven of these incidents (sites B6, 15, 181, 440, BT471, BT472, and 484 shown on Figure 5.9-1) involved releases of 165 to 3,300 gallons of sewage occurring between 2010 and 2023. Most releases were to storm drains, including several reaching Sausal Creek; generally, they were contained and all were fully or partially recovered except one. Although these incidents were near project excavation areas (existing power line structures to be replaced and underground lines), they are unlikely to impact the project based on confinement to storm drains and Sausal Creek, the nature of the sewage materials, containment and recovery actions, and time passed since the releases. Another incident (site Z193) involved the release of 200 gallons of mineral oil under a transformer concrete cap at Oakland X Substation in 2008, which was fully contained. This incident also is unlikely to impact the project since the release was fully contained. Finally, an unspecified release of an unreported substance in 1989 (site AM237) is unlikely to impact the project because of the time passed since the incident and its location 200 feet crossgradient to downgradient of the project.

The EDR report lists one Solid Waste Disposal Site on the CalRecycle Solid Waste Information System database within 0.25 mile of the rebuilt project site (EDR 2024). However, this site, a closed unpermitted disposal site for construction and demolition materials, is not located within 500 feet of project excavation areas. The EDR report also lists one Mineral Resources Data System (Mines MRDS) site located within 0.25 mile of the rebuilt project site. This site is identified as a calcium commodity deposit with a status of "prospect" referenced in 1947 and is located within 500 feet of an overhead power structure to be replaced. Materials are not known to have been extracted from this site and no other information is available.

In addition to these known historical sites, the EDR report identified six potential historical auto service/gasoline station sites and seven current or historical dry cleaner facilities within 500 feet of project excavation areas (EDR 2024). Other than closed LUST cases associated with two of the historical auto service/gasoline station sites, there are no documented records of releases of hazardous materials or investigations at these sites. However, historical auto service/gasoline stations are commonly associated with leaks from fuel or waste oil USTs and, historically, dry cleaners are commonly associated with leaks or spills from solvent tanks or associated equipment operations. Therefore, the potential for undocumented hazardous materials releases from these sites cannot be ruled out. These sites are summarized in Table 5.9-2 and shown on Figure 5.9-1. Besides these auto service/gasoline station and dry cleaner facilities, the EDR report identified 11 additional historical auto service/gasoline station sites and nine additional current or historical dry cleaner sites located within 0.25 mile of the rebuilt project site but greater than 500 feet from excavation areas.

Table 5.9-2. Historic Auto Service and Dry Cleaner Sites with 500 Feet of Project Excavation Areas

Site ID (Owner)	Address	Historic Use (Date)
Site O103 (Texaco Service Station)[a]	4500 Park Boulevard, Oakland	Gasoline service station (1933, 1943, 1971 to 2014)
Site F116 (Hanrahan Toms Chevron Service)	4239 Park Boulevard, Oakland	Gasoline service station (1971 to 1976)

Table 5.9-2. Historic Auto Service and Dry Cleaner Sites with 500 Feet of Project Excavation Areas

Site ID (Owner)	Address	Historic Use (Date)
Site F23 (Payless Cleaners)	4236 Park Boulevard, Oakland	Laundry 1967; garment pressing and cleaners' agent (1985 to 1988)
Site G25 (B&G Cleaners)	4209 Park Boulevard, Oakland	Cleaner and dyer (1967)
Site G36 (Oak Hillside Cleaners)	4208 Park Boulevard, Oakland	Dry cleaning plant, except rugs (1992 to 2014); dry cleaning and laundry service (since at least 2008)
Site H38 (Arena S Service Station)	4036 Park Boulevard, Oakland	Gasoline and oil service station (1928, 1933)
Site H65 (J&M Beacon Service Station)[b]	4035 Park Boulevard, Oakland	General automotive repair shop (1983 to 1988), gasoline service station (1986 to 1989)
Site J42 (Moore, Mrs. Carmen)	3820 Park Boulevard, Oakland	Clothes presser and cleaner (1933)
Site J43 (Park Jong, Alpine Cleaners)	3800 Park Boulevard, Oakland	Drycleaning plant, except rugs (1992 to 2014); drycleaning and laundry service (since at least 2018)
Site X149 (Hastings C F, Owensby J W)[c]	3761 Park Boulevard, Oakland	Gasoline and oil service station (1933, 1943)
Site BA409 (Thirteenth Avenue Cleaners)	3727 13th Avenue, Oakland	Cleaner and dyer (1967), carpet and upholstery cleaning (1982 to 1988)
Site CK559 (Richards, Frank)	1155 Excelsior Avenue, Oakland	Cleaners, dyer and pressers (1925, 1943)
Site EV967 (Oekers, Clarence)	1036 Hollywood Lane [Avenue], San Leandro [Oakland]	Gasoline and oil service station (1940)

Source: EDR 2024

[a] Also identified as a closed LUST site (Chevron #9-3415).

[b] Also identified as a closed LUST site (Desert Petroleum / J & M Service Station #793).

[c] Also identified as a closed LUST site (Private Residence).

5.9.1.8 Project-Related Hazardous Materials

Hazardous Material Use

Construction of the project will require the use of hazardous materials, such as fuels, lubricants, and cleaning solvents. The total amounts of these materials expected to be used during the entire duration of the project construction schedule are shown in Table 5.9-3. These will be used to power internal combustion engines, lubricate internal combustion engines and other construction equipment and hardware, and clean vehicles and equipment. It is anticipated that no pesticides or herbicides will be needed during construction activities. No painting or welding activities are expected. If needed, material will be transported in specialty trucks or in other approved containers.

Table 5.9-3. Types, Uses, and Volumes of Hazardous Materials Used in Construction

Hazardous Material	Use	Total Approximate Volume (gallons)
Diesel	Engine fuel	309,231
Gasoline	Engine fuel	35,422
Jet fuel	Fuel	38,119
Hydraulic Fluids/Lubricants	Engine and equipment lubrication and powering of hydraulic equipment	19,139

Hazardous Material	Use	Total Approximate Volume (gallons)
Other Construction Fluids (solvents)	Cleaning, lubricating hardware, etc.	957

Hazardous materials identified will not be stored onsite. All fueling and storage will occur offsite.

Diesel and gasoline fuel volumes are from Section 5.6 Energy.

Hydraulic fluids and lubricants volumes are anticipated to be 5% of total fuel volumes.

Other construction fluids volumes are anticipated to be 5% of hydraulic fluids and lubricants volumes.

When not in use, hazardous materials will be properly stored to prevent drainage or accidents as instructed by SDSs that will be provided to onsite personnel in case of emergency. The anticipated volume of hazardous liquid materials such as fuel is calculated based on onboard amounts expected to be used by the equipment and vehicles. These hazardous liquid materials will not be stored onsite at the total approximate volume. As hazardous liquid materials are needed, they will be obtained by construction vehicles at a gas station, and other materials such as hydraulic fluids/liquids will be ordered at volumes that are appropriate for storage on a maintenance truck and dispensed at one or more staging areas during limited maintenance activities such as topping of fluids. Fuel trucks will bring diesel fuel for the generators as needed and diesel fuel will not be stored onsite. Oil changes and full maintenance activities will occur at a PG&E yard, contractor yard, or licensed mechanics shop outside of the project footprint. A Spill Prevention, Control, and Countermeasure (SPCC) Plan or a Hazardous Materials Business Plan (HMBP) is not expected to be required (in accordance with 40 CFR Parts 112.1-112.7 and California Health and Safety Code [CA HSC] Section 25507, respectively). If a contractor elects to have larger volumes on site, plans will be developed as appropriate.

Project O&M activities will be part of PG&E's routine O&M, as is currently done for the existing power lines. O&M activities will occur for a similar total line length and use typical O&M vehicles and equipment.

Hazardous Waste

Limited hazardous waste will be generated during both project construction and operations and will be handled and disposed of in accordance with local, state, and federal requirements. Typical hazardous waste derived during construction may include limited quantities of used oil, containers, rags, and other used petroleum products. In addition, waste from existing steel tower components, concrete footings, and treated wood poles will be generated during replacement. Steel tower components are not expected to have lead paint. If testing shows that steel tower components have lead paint, the components will be taped with duct tape at the location where metal pieces are cut before they are cut to avoid paint chipping and they will be removed and disposed of at a licensed waste facility per applicable regulations. Concrete footings may contain asbestos and will be tested prior to construction. If the footings contain asbestos, they also will be removed and disposed of at a licensed waste facility per applicable regulations.

Treated wood waste has the potential to be classified as hazardous waste if it contains elevated levels of arsenic, chromium, copper, pentachlorophenol, or creosote. Treated wood waste often can be visually identified by tags or markings on the wood, when cut staining is visible around the perimeter only, or by discoloration or odor. If encountered, treated wood waste will be managed in accordance with applicable California and federal regulations. PG&E will dispose of utility-generated waste, including treated wood waste, under the Hazardous Waste Fee Health and Safety Code (CA HSC Chapter 6.5, Section 25143 et seq.). Under this exemption, the wood waste will be disposed of in a composite-lined portion of a municipal solid waste landfill that meets requirements imposed by the state policy adopted pursuant to Section 13140 of the Water Code and regulations adopted pursuant to Sections 13172 and 13173 of the Water Code. Further, the solid waste landfill used for disposal is authorized to accept the wood waste under waste discharge requirements issued by the RWQCB pursuant to Division 7 (commencing with Section 13000) of the Water Code.

5.9.2 Regulatory Setting

The following sections contain an overview of regulations related to the use of hazardous materials and the disposal of hazardous wastes.

5.9.2.1 Federal

Resource Conservation and Recovery Act

Under RCRA (42 USC Section 6901 et seq.), individual states may implement their own hazardous waste programs in lieu of RCRA if the state program is at least as stringent as the federal RCRA requirements. The federal government approved California's RCRA program, called the Hazardous Waste Control Law (HWCL), in 1992. In California, the RCRA program is administered by the California Environmental Protection Agency (CalEPA) DTSC, per direction of the EPA.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC Chapter 103) and associated Superfund Amendments provide the EPA with the authority to identify hazardous sites, to require site remediation, and to recover the costs of site remediation from polluters. CERCLA also enabled the revision of the National Oil and Hazardous Substances Pollution Contingency Plan, also known as the National Contingency Plan (NCP). The NCP provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants.

Clean Water Act

The CWA gives EPA the authority to regulate the discharge of pollutants and hazardous materials into the waters of the United States. As part of the CWA, EPA oversees and enforces the oil pollution prevention regulation (40 CFR Part 112). The regulations describe the requirements for facilities to prepare, amend, and implement SPCC plans to describe a comprehensive spill prevention program that minimizes the potential for discharges from specific sources, such as oil-containing transformers.

Federal Water Pollution Control Act

The EPA designates hazardous substances under the federal Water Pollution Control Act (40 CFR Chapter I, Subchapter D, Parts 116 and 117) and determines quantities of designated hazardous substances that must be reported (40 CFR Part 116) or that may be discharged into waters of the United States (40 CFR Part 117).

U.S. Department of Transportation Hazardous Materials Regulations

The U.S. Department of Transportation (DOT) Hazardous Materials Regulations (Title 49 CFR Parts 100 185) cover all aspects of hazardous materials packaging, handling, and transportation.

Federal Aviation Administration Regulations

The FAA regulates the safe use and preservation of navigable airspace. The FAA must be notified of any structures located in the airspace of an airport as defined in 14 CFR Section 77.9 (b)(1), (2), and (3), or new structures taller than 200 feet in height, to confirm that the proposed structures will not pose a threat to safety.

5.9.2.2 State

Hazardous Waste Control Law

The HWCL (CA HSC Chapter 6.5, Section 25100 et seq.) authorizes CalEPA and the DTSC, a department within CalEPA, to regulate the generation, transport, treatment, storage, and disposal of hazardous wastes. DTSC also can delegate enforcement responsibilities to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of HWCL. Businesses that store more than threshold quantities of hazardous materials must prepare an HMBP, which includes spill prevention and response provisions.

Hazardous Substance Account Act

The Hazardous Substance Account Act (HSAA) (CA HSC Chapter 6.8, Section 25300 et seq.) is California's equivalent to CERCLA. It addresses hazardous waste sites and apportions liability for them. The HSAA also provides that owners are responsible for the cleanup of such sites and the removal of toxic substances, where possible.

The two state agencies with primary responsibility for enforcing federal and state regulations related to hazardous material transport and responding to hazardous materials transportation emergencies are the California Highway Patrol and California Department of Transportation, respectively.

Occupational Safety and Health

CalOSHA assumes primary responsibility for developing and enforcing workplace safety regulations within the state (CCR Title 8). CalOSHA standards are more stringent than federal Occupational Safety and Health Administration regulations and take precedence. Section 1518 of the California PRC requires that suitable protection equipment or devices will be provided or used on or near energized equipment for the protection of employees where there is a recognized hazard of electrical shock or burns.

Hazardous Materials Management

The California Office of Emergency Services is the state office responsible for establishing emergency response and spill notification plans related to hazardous materials accidents. Title 26 of the CCR is a compilation of the chapters or titles of the CCR that are applicable to hazardous materials management.

Porter-Cologne Water Quality Control Act

As discussed in more detail in Section 5.10, Hydrology and Water Quality, the Porter-Cologne Water Quality Control Act (California Water Code, Division 7) is the provision of the California Water Code that regulates water quality in California and authorizes the SWRCB and nine RWQCBs to implement and enforce the regulations. The Porter-Cologne Act provides several means of enforcement for unauthorized discharge of pollutants to waters of the state, including cease and desist orders, cleanup and abatement orders, administrative civil liability orders, civil court actions, and criminal prosecution. The project area is under the jurisdiction of the San Francisco Bay RWQCB (Region 2).

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) (CCR Title 27) was mandated by the state of California in 1993. The Unified Program was created to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for six hazardous materials programs. The program has six elements, including:

- Hazardous Waste Generators and Hazardous Waste On-site Treatment
- Underground Storage Tanks
- Aboveground Petroleum Storage Act

- Hazardous Materials Release Response Plans and Inventories
- California Accidental Release Prevention
- Uniform Fire Code Hazardous Materials Management Plans and Hazardous Materials Inventory Statements

At the local level, implementation if a Unified Program is accomplished by identifying a CUPA that coordinates all of these activities to streamline the process for local businesses. The Contra Costa County Environmental Health and the ACDEH are approved by CalEPA as the CUPA for their respective counties.

Hazardous Waste Fee Health and Safety Code

The CA HSC, Chapter 6.5, Section 25143 et seq., provides definition and guidance on wood waste and its disposal. Wood waste is defined in part as poles, crossarms, pilings, and fence posts that have been previously treated with a preservative.

Wood waste materials removed from electric, gas, or telephone service are exempt from the requirements for disposal provided certain conditions are met, including:

If the wood waste is not subject to regulation as a hazardous waste under a federal act and it is disposed of in a composite-lined portion of a municipal solid waste landfill that meets any requirements imposed by the state policy adopted pursuant to Section 13140 of the Water Code and regulations adopted pursuant to Sections 13172 and 13173 of the Water Code.

If the solid waste landfill used for disposal is authorized to accept the wood waste under waste discharge requirements issued by the RWQCB pursuant to Division 7 (commencing with Section 13000) of the Water Code

Rules for Overhead Electric Line Construction

Under Section 35 of GO 95, the CPUC regulates all aspects of design, construction, operation, and maintenance of electrical power lines and fire safety hazards for utilities subject to its jurisdiction.

Public Resources Code

PRC Sections 4292 and 4293 identify construction, operation, and maintenance requirements to minimize fire hazards for power lines located in SRAs. PRC Section 4292 addresses power line hazard reduction. It identifies the requirements for firebreaks around "any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole" in wildland areas. PRC Section 4293 provides specific clearances for power lines in wildland areas.

Fire Prevention Standards for Electric Utilities

The Fire Prevention Standards for Electric Utilities (CCR Title 14, Sections 1250 to 1258) provide definitions, maps, specifications, and clearance standards for projects under the jurisdiction of PRC Sections 4292 and 4293 in SRAs.

Additional regulations related to fire prevention are discussed in detail in Section 5.20, Wildfire.

California Fire Code

The California Fire Code 2010 (CCR Title 24, Part 9) is based on the International Fire Code from the International Code Council and contains consensus standards related to establishing good practices to safeguard the public health, safety, and general welfare from the hazards of fire, explosion, or dangerous conditions in new or existing buildings, structures, and premises.

5.9.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for CUPAs with respect to hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process. Additional local plans and policies regarding emergency response are presented in Section 5.20, Wildfire.

County Adopted Emergency Response Plans

The Contra Costa Operational Area Emergency Operations Plan provides effective management of response forces and resources in preparing for and responding to situations associated with natural disasters, technological incidents, intentional acts, and national security emergencies (Contra Costa County 2011). During a disaster or emergency, the emergency management will coordinate emergency response and recovery operations; coordinate with appropriate federal, state, and other local government agencies; establish priorities and resolve conflicting demands for support; prepare and disseminate emergency public information to alert, warn, and inform the public; and disseminate damage information and other essential data.

The Alameda County Emergency Operations Plan (EOP) is the base plan that governs the roles and responsibilities of Alameda County in times of extraordinary emergency or disaster (Alameda County 2012). It establishes the foundational policies and procedures that define how the County will effectively prepare for, respond to, recover from, and mitigate against natural or human-caused disasters. The EOP identifies emergency response policies, describes the emergency response and recovery organization and activation, and assigns specific roles and responsibilities to County departments, agencies, and community partners.

County Departments of Environmental Health

Contra Costa County Environmental Health, under the CUPA Program, also enforces state regulations governing hazardous materials storage, hazardous waste generators, and hazardous substance USTs. The ACDEH, under the CUPA Program, enforces state regulations governing hazardous materials storage, hazardous waste generators, aboveground petroleum storage, accidental release prevention, and hazardous substance USTs. Both county departments assist businesses in preparing Hazardous Materials Release Response Plans and Inventories (Business Plans). The departments also perform oversight of investigation and cleanup activities at soil and groundwater contaminated sites, either as lead agencies or under the lead of the SWRCB.

Airport Land Use Plans

The project area is not located within the jurisdiction of any airport land use plans.

5.9.2.4 Touch Thresholds

Federal Occupational Safety and Health Administration (OSHA) general industry electrical safety standards are published in Title 29 CFR Part 1910.302 through 1910.308, Design Safety Standards for Electrical Systems, and 1910.331 through 1910.335, Electrical Safety-Related Work Practices Standards (National Archives and Records Administration Office of the *Federal Register* 2021). OSHA's electrical standards are based on the National Fire Protection Association (NFPA) codes and standards: NFPA 70 – National Electrical Code and NFPA 70E – Standard for Electrical Safety in the Workplace (NFPA 2022).

CalOSHA regulations on electrical safety require California employers to provide workers with a safe and healthful workplace. These regulations are contained in Title 8 of the CCR. Most of the electrical health and safety regulations can be found in Chapter 4, Subchapter 5 in the Electrical Safety Orders, Sections 2299 through 2989. CalOSHA regulations on electrical safety are grouped by electrical voltage units. Regulations for low voltage (0 to 600 volts [V]) are given in Sections 2299 to 2599 and regulations for high voltage (greater than 600 V) are given in Sections 2700 to 2989. Section 1518 addresses the safety requirements for the protection of workers and others from electric shock in construction.

The project will be designed to all applicable standards and regulations that will provide for adequate horizontal and vertical clearances from electrical equipment. All authorized personnel working onsite, during either construction or O&M, will be trained according to OSHA, CalOSHA, NFPA, and PG&E standards. All electric power lines will be designed in accordance with CPUC GO 95 guidelines for safe ground clearances established to protect the public from electric shock.

5.9.3 Impact Questions

The impact questions include all hazards and hazardous materials impact questions in the current version of CEQA Guidelines, Appendix G.

The project's potential effects on hazards, hazardous materials, and public safety were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.9-4 and discussed in more detail in Section 5.9.4.

Table 5.9-4. CEQA Checklist for Hazards, Hazardous Materials, and Public Safety

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 which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒

Table 5.9-4. CEQA Checklist for Hazards, Hazardous Materials, and Public Safety

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

5.9.3.1 Additional CEQA Impact Questions

The project's potential effects on hazards, hazardous materials, and public safety also were evaluated using the CPUC's Additional CEQA Impact Questions for Hazards, Hazardous Materials, and Public Safety in the Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments (CPUC 2019). These additional impact questions are evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.9-5 and discussed in more detail in Section 5.9.4.

Table 5.9-5. Additional CEQA Impact Questions for Hazards, Hazardous Materials, and Public Safety

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Would the project create a significant hazard to air traffic from the installation of new power lines and structures?	☐	☐	☐	☒
b) Would the project create a significant hazard to the public or environment through the transport of heavy materials using helicopters?	☐	☐	☒	☐
c) Would the project expose people to a significant risk of injury or death involving unexploded ordnance?	☐	☐	☐	☒
d) Would the project expose workers or the public to excessive shock hazards?	☐	☐	☒	☐

5.9.4 Potential Impact Analysis

Project impacts related to hazards, hazardous materials, and public safety were evaluated against the CEQA significance criteria and are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and the O&M phase.

5.9.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts related to hazards, hazardous materials, and public safety were evaluated for each of the criteria listed in Table 5.9-4, as discussed in Section 5.9.4.3.

5.9.4.2 Applicant-Proposed Measures

The project will have less-than-significant impacts on hazards, hazardous materials, and public safety. Implementation of the APMs that follow will further minimize potential impacts.

APM HAZ-1: Development and Implementation of Hazardous Material and Emergency Response Procedures. PG&E will implement construction controls, training, and communication to minimize the potential exposure of the public and site workers to potential hazardous materials during all phases of project construction. Construction procedures that will be implemented include worker training appropriate to the worker's role, and containment and spill control practices in accordance with the SWPPP (APM HYD-1).

APM HAZ-2: Emergency Spill Supplies and Equipment. Materials will be available on the project site during construction to contain, collect, and dispose of any minor spill. Oil-absorbent material, tarps, and storage drums will be available on the project site during construction and will be used to contain and control any minor releases of oil. If excess water and liquid concrete escape during pouring, they will be directed to adjacent lined and bermed areas, where the concrete will dry and then be transported for disposal per applicable regulations.

APM HAZ-3: Shock Hazard Safety Measures. All authorized personnel working on site, during either construction or O&M, will be trained according to PG&E standards. Training will be implemented prior to construction by PG&E or construction contractor safety managers. A record of when the safety training occurred, the safety manager delivering the training and who attended will be stored by the contractor and available for review by PG&E and the CPUC as requested. Training will include identifying electrical hazards, establishing safe distances from the lines, deenergizing lines where appropriate, and use of personal protective equipment such as arc flash-resistant apparel. The public will be excluded from work areas. When power lines are energized during construction and operation, they are suspended in the air at the requisite ground clearance distance that avoids shock or arc flash hazard to the public.

APM HAZ-4: Worker Environmental Awareness Training Program. A worker environmental awareness training program (WEAP) will be developed and implemented prior to construction. The WEAP program will be established to communicate environmental concerns and appropriate work practices to all construction field personnel. The training program will emphasize site specific physical conditions to improve hazard prevention and will include a review of the SWPPP, which also will address spill response and proper BMP implementation. The WEAP program will be provided separately to CPUC staff prior to construction. If it is necessary to store chemicals, they will be managed in accordance with all applicable regulations. Safety data sheets will be maintained and kept available onsite, as applicable.

APM HAZ-5: Potentially Contaminated Soil or Groundwater. Where there is known potential of contaminated soil in the area based on review of databases of hazardous materials and sites, soil sampling will be conducted in project areas prior to or upon commencement of construction. Soil that is known (based on testing prior to or upon commencement of construction) or suspected of being contaminated (based on visual, olfactory, or other evidence identified during construction) and is removed during trenching or excavation activities will be segregated. These segregated soils will require testing and investigation procedures to be supervised by a qualified person, as appropriate, to meet state and federal regulations before disposal at a non-PG&E facility that is licensed to handle the soil based on contaminants identified from test results. If the soil is taken to a PG&E spoils facilities, the soil will be tested, handled, and disposed of in accordance with applicable state and federal regulations. Appropriate handling, transportation, and disposal locations will be determined based on results of the analyses. If the soil is contaminated above hazardous levels, it will be contained and disposed of offsite at a licensed waste facility. In addition, results will be provided to contractor and construction crews to inform them about soil conditions and potential hazards. The location, distribution, and frequency of the sampling locations where there is a known potential of contaminated soil in the area will be determined during final design with the intent to provide adequate representation of the conditions in the construction area. Groundwater is not expected to be encountered during construction. However, if it is encountered, groundwater will be collected during construction, contained, tested, and disposed of in accordance with all applicable regulations. Containment will be done by pumping the groundwater into holding tanks. Noncontaminated groundwater will be released to the stormwater drainage system in the area (with prior approval). If the groundwater is contaminated, it will be disposed of at a facility that accepts liquid hazardous waste, in accordance with applicable regulations.

5.9.4.3 Potential Impact Analysis

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? *Less-than-Significant Impact*.

Construction of the project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Table 5.9-3 identifies hazardous materials expected to be used onsite during construction.

Construction of project facilities will require the use of motorized heavy equipment, including trucks, cranes, backhoes, and air compressors. Although this equipment requires the use of hazardous materials, such as gasoline, diesel, oil, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, and other fluids, these materials will be transported to the work sites according to DOT standards and used in designated construction staging areas or other suitable locations identified prior to the onset of construction. APM HAZ-2 and APM HAZ-4 require construction crews to be trained in safe handling of hazardous materials prior to the initiation of construction, which will further reduce the small risk of minor exposures to the environment, the public, or site workers to potentially hazardous materials during construction. PG&E will follow its existing worker training programs.

The project is not expected to use or store large quantities of hazardous materials. During construction, typical petroleum-based products such as gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents will be used to fuel, lubricate, and clean vehicles and equipment, and will be transported in specialty trucks or in other approved containers. When not in use, hazardous materials will be properly stored to prevent drainage or accidents as instructed by SDSs that will be provided to onsite personnel in case of emergency. The anticipated volume of hazardous liquid materials, such as fuel, are calculated based on the onboard amounts expected to be used by equipment and vehicles during construction. These hazardous liquid materials will not be stored onsite at the total approximate volume. As hazardous liquid materials are needed, they will be obtained by construction vehicles at a gas station, and other materials such as hydraulic fluids/liquids will be ordered at volumes that are appropriate for storage on a maintenance truck and dispensed at one or more staging areas during a routine maintenance activity. Fuel trucks will bring diesel fuel for the generators as needed and diesel fuel will not be stored onsite. During construction, an SPCC Plan or an HMBP is not expected to be required (in accordance with 40 CFR Parts 112.1–112.7 and CA HSC Section 25507, respectively). If a contractor elects to have larger volumes on site, plans will be developed as appropriate.

Because hazardous materials will be transported, used, and disposed of in accordance with appropriate procedures, the project will not create a significant hazard to the public or environment. Any impacts will be less than significant, and PG&E's existing worker safety training programs described in APM HAZ-2 and APM HAZ-4 will further reduce less-than-significant impacts.

There will be no large volumes of known hazardous waste resulting from project construction. Minor volumes of hazardous waste will be disposed of using the appropriate methods of handling and transportation, with disposal at a certified hazardous waste disposal facility. Existing concrete footings that contain asbestos will be disposed of offsite at a licensed hazardous waste facility. Treated wood waste removed from the project area during construction will be managed under the utility exemption of the CA HSC. Treated wood waste will be transported offsite and will be collected in project-specific containers either at a PG&E service center that is designated as a PG&E consolidation site or the project's primary staging area. When the containers are filled, the waste will be transported to an appropriate licensed Class I or Class II landfill or the composite-lined portion of a solid waste landfill. The transport and disposal of these wastes will not pose a significant hazard to the environment or the public.

As discussed in Section 5.9.1.7, databases were reviewed for existing hazardous materials and sites in the project area. No known contamination was identified within areas of planned project excavation. However, as noted in Section 5.9.1.7, the potential for undocumented hazardous materials releases in the project excavation areas from the LUST and dry cleaner sites listed in Table 5.9-2 cannot be ruled out. In addition, the LUST site T10000000818 on the 3761 block of Park Boulevard Way is 100 feet upgradient of planned excavation areas and also may have undocumented releases in the project area. Soil sampling will be conducted in project excavation areas within 500 feet of site T10000000818 and the sites listed in Table 5.9-2 prior to or upon commencement of construction, in accordance with APM HAZ-5. In addition, there is potential for unknown contaminated soils to be encountered during construction, primarily in the urban areas in the central and western sections of the project. The contamination will be identified based on visual, olfactory, or other evidence. Soil that is known to be contaminated based on the testing prior to or upon commencement of construction, or that is identified as being contaminated during construction, will be removed during trenching or excavation activities and will be segregated, tested, transported, and disposed of as described in APM HAZ-5. Contaminated soils are not expected to occur where the project passes through undeveloped areas and open space in Contra Costa County and along parks in the City of Oakland. Groundwater is not expected to be encountered during construction (refer to Section 5.10, Hydrology and Water Quality). However, if it is encountered, groundwater will be collected during construction, contained, tested, and disposed of as described in APM HAZ-5. Facilities that accept liquid hazardous waste in California are the Kettleman Hills and Buttonwillow landfills; refer to Table 5.19-1 in Section 5.19 Utilities.

No changes in operation and maintenance activities are anticipated with implementation of the project. The routine annual inspections, detailed inspections, and aerial inspections and as-needed maintenance of power lines will not change from existing conditions, except for the underground portion in the western section of the project, where routine inspections and as-needed maintenance will be conducted on underground facilities. Therefore, no impacts associated with operation and maintenance will occur.

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? *Less-than-Significant Impact*.

Project construction will require the use of motorized heavy equipment, including trucks. During construction activities, there is an increased potential for an accidental release of fluids from a vehicle or motorized piece of equipment. To reduce the likelihood and significance of an accident involving hazardous materials, APM HAZ-1, APM HAZ-2, and APM HAZ-4 will provide crews with knowledge, preparation, techniques, and materials to avoid exposing the public, project crews, and environmental resources to hazardous materials. In the event of an accidental release of hazardous material caused by an upset or accident, crews will follow protocol outlined by APM HAZ-1, APM HAZ-2, and APM HAZ-4 to minimize the effects of an accidental spill. These BMPs include having spill kits in all active work areas to be used to prevent materials from draining onto the ground or into drainage areas in the event of a spill.

Although not expected, if USTs or aboveground storage tanks are found to be located along the power line route and the project cannot be adjusted to avoid disturbance, the tanks will be removed prior to project construction or segregated from the work area and not disturbed. If it is determined that removal of tanks is necessary, a separate work plan describing the proper decommissioning and removal of the tanks and removal of any associated impacted soil will be prepared prior to removal.

Construction of the project will include mechanisms intended to protect the public from accidents or failure of project components. Guard structures will be installed on the sides of roadways and potentially in other public areas to provide protection in the event of a dropped cable. Shoring will be installed at trenching and excavation sites. Further, the public will not be permitted near construction activities by using fencing, signage, and traffic control.

No changes in operation and maintenance activities are anticipated with implementation of the project. The routine annual inspections, detailed inspections, and aerial inspections and as-needed maintenance of power lines will not change from existing conditions other than activities in the western portion of the project will be conducted on underground facilities. Therefore, no impacts associated with operation and maintenance will occur.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? *Less-than-Significant Impact*.

Seventeen schools are located within approximately 0.25 mile of the rebuilt project site (refer to Table 5.15-1 in Section 5.15, Public Services). No acutely hazardous materials or waste will be used or will be generated by the project. Construction impacts will be associated with the use of equipment with hydraulic fluids and fuels that could create a hazard in the event of a spill. However, implementation of APM HAZ-1 and APM HAZ-2 will further reduce the potential less-than-significant impact. No changes in operation and maintenance activities are anticipated with implementation of the project; routine operations and maintenance on underground portion will be the same as performed on other underground lines. Therefore, no impacts associated with operation and maintenance will occur.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? *No Impact*.

The proposed project is not located on sites listed pursuant to Section 65962.5, as described in Section 5.9.1.7. No impact will occur because project construction will not occur on listed properties. Implementation of APM HAZ-5 will further ensure that human health and the environment are protected. The operations and maintenance associated with the project is not expected to include disturbance of subsurface materials, so no impact will occur during this phase.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? *No Impact*.

The proposed project is not located within an airport land use plan or within 2 miles of a public airport or public use airport. Therefore, the project will not result in a safety hazard for people residing or working in the project area during either the construction or the operations and maintenance phases and no impact will occur.

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? *Less-than-Significant Impact*.

The proposed project will not conflict with an adopted emergency response plan or evacuation plan. The Contra Costa Operational Area EOP provides effective management of response forces and resources in preparing for and responding to situations associated with natural disasters, technological incidents, intentional acts, and national security emergencies (Contra Costa County 2011). The Alameda County EOP establishes the foundational policies and procedures that define how the County will effectively prepare for, respond to, recover from, and mitigate against natural or human-caused disasters (Alameda

County 2012). As discussed in Section 5.20, Wildfire, the two counties as well as the cities of Orinda, Oakland, and Piedmont use Genasys Protect (previously known as Zonehaven Aware), which is an evacuation management platform that helps communities and first responders plan, communicate, and execute evacuations in the event of an emergency.

Temporary road and lane closures (including rolling stops) are anticipated when certain sections of the PG&E lines are being removed or reconductored at the road overhead crossings. In some locations, road closures may last up to approximately 10 working days (2 calendar weeks), primarily for crane work activities on surface streets. For the underground power line construction, temporary short-term closures of one travel lane and one parking lane along Estates Drive, Park Boulevard, and Park Boulevard Way are expected for the placement of the vaults, trenching, and duct bank installation, with one lane remaining open to allow through traffic in each direction. Where temporary partial or complete road closures occur, PG&E will implement APM TRA-1: PG&E Temporary Traffic Controls to minimize effects on traffic and transportation, including emergency vehicle access and evacuation routes. Construction impacts to emergency access and evacuation will be less than significant.

No negative impact to emergency access will result from operation of the project. The project will not impair the implementation of or physically interfere with an adopted emergency response or evacuation plan; therefore, no impact will occur.

g) Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? *Less-than-Significant Impact*.

Wildfire risk is discussed in Section 5.20, Wildfire. The eastern segment of the project alignment passes through generally undeveloped hills with a mix of grasslands, chaparral, and woodland. The central segment passes through vegetated hillside residential development areas. As discussed in Section 5.9.1.4, much of the project is in CAL FIRE designated FHSZ and CPUC designated HFTDs. The primary risk for potential fire hazards will be associated with the use of vehicles and equipment during construction that could generate heat or sparks that could ignite dry vegetation and cause a fire. During construction, PG&E will implement APM WFR-1 Construction Fire Prevention Plan and APM WFR-2 Fire Prevention Practices, which require workers to be trained in fire prevention practices and carry emergency fire suppression equipment to reduce the wildland fire risk in the project area. PG&E will continue to comply with its current Wildfire Mitigation Plan. Construction impacts to people and structures from wildland fires is less than significant. The western segment is underground and in a highly urbanized area and wildfire risks will be low.

No changes in operation and maintenance activities are anticipated with implementation of the project. As discussed in Section 5.20, Wildfire, the completed project reduces risk of a wildfire occurring along the alignment. Therefore, no impacts associated with operation and maintenance will occur.

5.9.4.4 Additional Impact Questions

a) Would the project create a significant hazard to air traffic from the installation of new power lines and structures? No Impact.

The project construction and O&M activities will not create a significant hazard to air traffic from the installation of PG&E project components. While PG&E has coordinated with the FAA, submitting a Notice of Proposed Construction or Alteration, pursuant to Title 14 CFR, Section 77, for each expected rebuilt 115 kV structure. The FAA has not found a need for any marking or lighting on the expected structures (Appendix F2). Further, PG&E will coordinate with nearby airports regarding helicopter flight plans for construction activities. No changes in operation and maintenance activities are anticipated with implementation of the project. No impact will occur.

b) Would the project create a significant hazard to the public or environment through the transport of heavy materials using helicopters? *Less-than-Significant Impact*.

Light-duty, medium-duty, and heavy-duty helicopters are expected to be used only in the eastern section of the project as part of the conductor stringing operation and to support construction survey staking; lifting or transporting of structure components; crew transport to towers; and lifting of equipment for installation of towers. Helicopters carrying load are not expected to be flown over residences or west of Manzanita Drive. In the unlikely event that final construction plans require otherwise, all FAA requirements will be met, and PG&E will coordinate with potentially affected residents, providing a minimum of 30 days of advance notice. Trails and roads used by the public will be managed with traffic control measures and flaggers to temporarily pause access and vacate the trail or road while helicopters fly loads over the trail or road. Impacts to the public or environment through the transport of heavy materials using helicopters during construction is less than significant.

No changes in operation and maintenance activities, including use of helicopters, are anticipated with implementation of the project. Therefore, no impact from project operation and maintenance will occur.

c) Would the project expose people to a significant risk of injury or death involving unexploded ordnance? *No Impact*.

Based on preliminary geotechnical borings, blasting is not anticipated for construction of project components, including foundation installation. Jackhammers will be used to remove existing foundations. No portion of PG&E project components overlies a current or former military installation (State of California Office of Governor Gavin Newsom 2024). Therefore, no unexploded ordnance is expected to be encountered. No changes in operation and maintenance activities are anticipated with implementation of the project. As a result, the project will not expose people to a significant risk of injury or death involving unexploded ordnance, resulting in no impact.

d) Would the project expose workers or the public to excessive shock hazards? *Less-than-Significant Impact*.

The design and construction of PG&E project components will comply with federal and state regulations and standards. All authorized personnel working onsite during either construction or O&M will be trained according to OSHA safety standards (United States Department of Labor 2019), which are based on applicable federal, state, and local safety regulations. To reduce shock hazards and avoid electrocution of workers or the public, PG&E will comply with the provisions found in CalOSHA Title 8 of the CCR, particularly the electrical health and safety regulations found in Chapter 4, Subchapter 5 in the Electrical Safety Orders, Sections 2700 to 2989, which are relevant to high-voltage work.

Other potential construction hazards include the presence of high-voltage, open-air conductors, which can create a high-temperature electrical arc between the electrical conductor and persons or objects. PG&E's power lines and substation facilities are designed and constructed with grounding devices, and in the event of a lightning strike on a power line, this safety feature ensures that the strike is discharged to appropriate ground, and all workers will be trained in appropriate safety procedures, as described in APM HAZ-3. As such, impacts associated with exposure of workers and the public to excessive shock hazards will be less than significant.

5.9.4.5 CPUC Draft Environmental Measures

None.

5.10 Hydrology and Water Quality

This section describes existing conditions and potential impacts to hydrological resources, water quality, and flood control as a result of construction, operation, and maintenance of the project. The analysis concludes that impacts will be less than significant in these areas; the implementation of APMs described in Section 5.10.4.3 will further reduce less-than-significant impacts. The project's potential effects on hydrology, water quality, and flood control were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.10-2 and discussed in more detail in Section 5.10.4.

5.10.1 Methodology and Environmental Setting

5.10.1.1 Methodology

Information on surface water and groundwater in the project area was obtained from published studies prepared by state, county, and local water agencies and related organizations, including the following:

- Alameda Flood Control and Water Conservation District, Creek and Watershed Map of Western Alameda County (Alameda Flood Control and Water Conservation District 2014)
- Alameda County, 2021 Alameda County Local Hazard Mitigation Plan (Alameda County 2022)
- California Department of Conservation (DOC)
- California Department of Water Resources (DWR)
- Contra Costa County, Contra Costa County Hazard Mitigation Plan (Contra Costa County 2018)
- East Bay Municipal Utility District, GSA
- Federal Emergency Management Agency (FEMA)
- San Francisco Bay RWQCB
- SWRCB
- USACE
- Western Regional Climate Center (WRCC)

5.10.1.2 Regional Setting

The project is in open space and urbanized areas in Contra Costa and Alameda counties, extending from the City of Orinda southwest through unincorporated Contra Costa County and into the Cities of Oakland and Piedmont. The project is situated within the San Francisco Bay Hydrologic Region, which covers approximately 4,500 square miles. This hydrologic region extends from southern Santa Clara County, north to Tomales Bay in Marin County, and inland to the crest of the Coast Ranges. Streams in the region flow into San Francisco Bay or the Pacific Ocean. Urban development in some areas has included construction of underground culverts and storm drains to replace creeks; filling areas of tidal marshes, lakes, and the bay; and construction of artificial lakes and reservoirs.

The westernmost area of the project is located within the East Bay Plain Sub-basin of the Santa Clara Valley Groundwater Basin (DWR 2004) as shown on Figure 5.10-1. Most of the project area to the east of this sub-basin boundary does not occur within an identified groundwater basin.

The local topography generally is very hilly along the majority of the existing and proposed overhead rebuild routes from Moraga Substation in Orinda west to Shepherd Canyon in Oakland. In these areas, elevation ranges from approximately 650 feet above sea level at the eastern end of the project at Moraga Substation, to a local maximum of approximately 1,170 feet above sea level near the western boundary of the City of Orinda, down to approximately 830 feet above sea level at the San Leandro

Creek crossing, to a maximum of approximately 1,370 feet above sea level at the Contra Costa-Alameda County line, to approximately 360 feet above sea level at the Sausal Creek crossing in Shepherd Canyon and 400 feet above sea level at the Shepherd Canyon rim. The proposed underground route within Park Boulevard slopes more gently from northeast to southwest toward the Bay. Elevation in this area ranges from approximately 400 feet above sea level at the Shepherd Canyon rim to approximately 140 feet above sea level at the western end of the project at Oakland X Substation.

The existing land uses in this project area include utility right-of-way within the City of Orinda; open space and parks within unincorporated Contra Costa County; residential, parks, churches and schools, and commercial land within the City of Oakland; and a church and associated school in the City of Piedmont.

5.10.1.3 Climate

The project area has a semi-arid Mediterranean climate, which is influenced by local topography and air circulation patterns. On the western side of the Oakland Hills, the climate is influenced by the Pacific Ocean, with relatively warm winters, cool summers, small daily and seasonal temperature ranges, and high relative humidity. Maritime influences decrease farther away from the coast. More inland portions of the project area transition to a more continental type of climate, with warmer summers, colder winters, greater daily and seasonal temperature ranges, and generally lower relative humidity. Precipitation in the project area is highly variable from year to year and is characterized by moderately wet winters and dry summers. Winter rains (December through March) account for approximately 75 percent of the average annual rainfall; approximately 90 percent of the annual total rainfall is received in the November to April period. Average annual precipitation in Alameda and Contra Costa counties from 1895 to 2023 was 18.32 inches and 18.48 inches, respectively (WRCC 2024).

5.10.1.4 Waterbodies

The project primarily passes through, or is bounded by, four watersheds as defined by the Alameda County Flood Control and Water Conservation District (2014) (Figure 5.10-2). The existing overhead lines pass through the San Leandro Creek, Sausal Creek, and Indian Gulch/Pleasant Valley Creek watersheds while the proposed underground rebuild portion is located within or along the boundary of the Sausal Creek, Indian Gulch/Pleasant Valley Creek, and Oakland Estuary watersheds. A small part of the project area, three potential staging areas and associated access, are located outside these watersheds. All four watersheds crossed by the project area comprise part of the South Bay Basin as defined by the San Francisco Bay RWQCB (RWQCB 2023). This basin drains into the Lower Bay, which is defined as the portion of San Francisco Bay south of the San Francisco-Oakland Bay Bridge and north of the Dumbarton Bridge.

San Leandro Creek Watershed

The eastern section of the project begins in the San Leandro Creek watershed in Contra Costa County (Figure 5.10-2). The San Leandro Creek watershed encompasses 49.4 square miles and extends from the upper tributaries of Moraga, San Leandro, and Redwood creeks in rural parklands and managed watersheds in the hills above Oakland and San Leandro, through San Leandro Reservoir and Lake Chabot, and along lower San Leandro Creek through San Leandro and Oakland toward San Francisco Bay.

Within this watershed, the closest surface waterbodies to the project include Moraga Creek, San Leandro Creek, and their tributaries. The northern boundary of Moraga Substation is approximately 50 feet south of the mainstem of Moraga Creek (Figure 5.10-2). The eastern end of the proposed overhead rebuild route is approximately 600 feet southwest of this creek mainstem. An underground culvert containing an unnamed tributary of Moraga Creek crosses beneath and across the southern portion of Moraga Substation (Figure 5.10-2).

Farther to the southwest, the proposed overhead rebuild route crosses an unnamed tributary of Upper San Leandro Creek at milepost 1.2 (Figure 5.10-2). An existing project access road runs directly adjacent and parallel to this tributary creek channel and also crosses the tributary channel on a bridge approximately 250 feet northeast of milepost 1.2. A secondary existing access road also crosses the tributary channel approximately 300 feet south of the same milepost.

Farther to the southwest, the overhead rebuild route crosses the mainstem of Upper San Leandro Creek at milepost 1.36 (Figure 5.10-2). This creek flows into Upper San Leandro Reservoir approximately 3.2 miles southeast of the overhead rebuild route. Upper San Leandro Reservoir is listed as an Integrated Report Category 5 waterbody under Section 303(d), which is defined as a waterbody whose beneficial uses are impaired by a pollutant for which a total maximum daily load (TMDL) is needed (SWRCB 2022). Mercury is the specific pollutant in the reservoir exceeding a water quality standard.

Sausal Creek Watershed

At approximately the county line between Alameda and Contra Costa counties, the proposed overhead rebuild route crosses into the Sausal Creek watershed within the City of Oakland (Figure 5.10-2). The Sausal Creek watershed encompasses 4.2 square miles, starting in the Oakland Hills with three main tributaries that join as Sausal Creek. Sausal Creek flows in a natural channel through Dimond Canyon and the upper portion of Dimond Park. In the Oakland flatlands, culverted sections of the Sausal Creek channel alternate with open stretches of creek before emerging into the Oakland Estuary, a strait between the City of Oakland and Alameda Island that adjoins San Francisco Bay. Regional development in the urbanized portion of the project area in Oakland, beginning in the Sausal Creek watershed, has increased the amount of impervious surface and the rates of runoff. Segments of local creeks have been channelized into culverts and runoff into these channels is managed aboveground and belowground as part of the stormwater conveyance systems. Sausal Creek is listed as an Integrated Report Category 4b waterbody under Section 303(d), which is defined as a waterbody whose beneficial use impairments are being addressed by regulatory actions other than a TMDL that are reasonably expected to result in attainment of the water quality standard within a reasonable, specified time frame (SWRCB 2022). This creek is impaired by a single pollutant, trash. Within Sausal Creek watershed, the next nearest waterbody to the project is Central Reservoir, a covered reservoir owned by EBMUD, which is approximately 2,200 feet southwest of the proposed underground route.

The proposed overhead rebuild route passes over two branches of Shephard Creek, one of three main tributaries of Sausal Creek, that are buried in underground culverts or storm drains at mileposts 1.97 and 2.29. The route then traverses open stretches of the three tributaries of Sausal Creek (Shephard Creek, Cobbledick Creek, and Palo Seco Creek) at mileposts 3.06, 3.16, and 3.42, respectively (Figure 5.10-2). Two existing project access routes located just southwest of Monterey Boulevard cross Palo Seco Creek; one route crosses a culverted section of the creek directly adjacent to milepost 3.42 and the other, walk-in access on a hiking trail, crosses approximately 700 feet upstream (southeast) of this milepost. Farther to the southwest, the existing overhead lines that will be rebuilt overhead span Sausal Creek in Dimond Canyon at milepost 3.82.

The transition between the overhead rebuild and the underground portion of the route occurs at milepost 3.93. The underground portion of the route is located within Park Boulevard and straddles the border between the Sausal Creek and the Indian Gulch/Pleasant Valley Creek watersheds until milepost 4.68 (Figure 5.10-2). Within the Sausal Creek watershed, the underground route runs parallel to and approximately 300 to 2,300 feet northwest of Sausal Creek.

Indian Gulch/Pleasant Valley Creek Watershed

The Indian Gulch/Pleasant Valley Creek watershed covers 3 square miles and includes Pleasant Valley Creek, Indian Gulch (also known as Trestle Glen Creek), and other small creeks. This watershed drains much of the City of Piedmont into the east arm of Lake Merritt, a tidal lagoon near downtown Oakland that connects to San Francisco Bay. The creeks in this watershed were not identified as having Section 303(d) status.

The proposed underground route runs along Park Boulevard on the boundary of the Indian Gulch/ Pleasant Valley Creek watershed from mileposts 3.93 to 5.04. At milepost 5.04, the route leaves Park Boulevard and runs a short distance to the northwest within the Indian Gulch/Pleasant Valley Creek watershed before terminating at Oakland X Substation (Figure 5.10-2). The portion of the route within Park Boulevard runs parallel to and approximately 900 feet southeast of several underground culvert and open creek segments of Indian Gulch. The western terminus of the project is located approximately 500 feet south of Indian Gulch Creek, 1 mile east of Lake Merritt, and approximately 1.6 miles northeast of the Oakland Estuary. Within the Indian Gulch/Pleasant Valley Creek watershed, other waterbodies near the project area are Tyson Lake (approximately 3,000 feet northwest of the proposed overhead rebuild route) and two covered reservoirs (Reservoir Number One and Reservoir Number Two, approximately 3,400 feet and 1 mile northwest, respectively, of the overhead rebuild route).

Oakland Estuary Watershed

The Oakland Estuary watershed covers 5.6 square miles and drains a large area of dense urban land uses in central Oakland into the Oakland Estuary. It includes Downtown Oakland, Brooklyn Basin, harbor areas, Highland Park, and the shores of Lake Merritt. The estuary was not identified as having Section 303(d) status.

The proposed underground route straddles the border of the Oakland Estuary watershed and the Indian Gulch/Pleasant Valley Creek watershed between mileposts 4.68 and 5.04 (Figure 5.10-2). An underground culvert, located approximately 300 feet southeast of the project underground route at milepost 4.95, originates near East 38th Street and ultimately drains into Oakland Estuary to the southwest. The culvert is entirely underground and is not associated with a named creek.

5.10.1.5 Flooding

The following sections describe flood hazards associated with established FEMA flood zones and flooding that could result from dam or reservoir failure, tsunamis, or seiches. As described in Section 5.10.4, potential flooding in the project area could affect the potential for the project to impede or redirect floodwaters or release pollutants during inundation.

FEMA Flood Zones

FEMA administers the National Flood Insurance Program (NFIP), which subsidizes flood insurance to communities that limit development in floodplains. As part of this program, FEMA maps all U.S. areas that fall within a 100-year floodplain (that is, areas with a greater-than-1-percent annual probability of flooding). Flood hazard areas identified on the Flood Insurance Rate Map (FIRM) are identified as Special Flood Hazard Areas (SFHAs), which are defined as the area that will be inundated by the flood event having a 1 percent chance of being equaled or exceeded in any given year. The 1 percent annual chance flood also is referred to as the base flood or 100-year flood and the area is designated as a FEMA Zone A type. Moderate flood hazard areas, designated as Zone B or Zone X (shaded), also are shown on the FIRM and are the areas between the limits of the base flood and the 0.2 percent annual chance flood (or 500-year flood). The flood hazards of the project area are shown on Figure 5.10-3.

No project areas along existing overhead routes, proposed overhead rebuild routes, or proposed underground routes are located within an identified SFHA or FEMA flood zone. One existing road for temporary construction access along Wilder Road to the northwest of Moraga Substation crosses an area of 1 percent annual chance flood along an upper tributary of San Pablo Creek (Figure 5.10-3).

Dam or Reservoir Failure Inundation

Dams and reservoirs, which hold large volumes of water, represent a potential hazard attributable to failure caused by ground shaking. The California DWR has identified areas of potential inundation in the event of dam failures throughout California. Projected inundation limits are approximate and assume severe failures; thus, the limits encompass all potential flooded areas in the improbable occurrence of dam failure. According to dam and reservoir failure inundation maps prepared by the DWR (DWR 2015) and presented in Alameda County and Contra Costa County local hazard mitigation plans (Alameda County 2022; Contra Costa County 2018), no project areas are located within identified dam or reservoir failure inundation areas (refer to Figure 5.10-3).

Tsunamis

Tsunamis are large waves in the ocean or other large waterbodies generated by earthquakes, coastal or submarine landslides, or volcanoes. Most California tsunamis are associated with distant earthquakes, typically in Alaska or South America, and not with local earthquakes. Damaging tsunamis are not common on the California coast. Because of the lack of reliable information regarding tsunami runups that have occurred in the prehistoric past, there is considerable uncertainty over the potential extent of tsunami runup that could occur in the Bay Area; research is ongoing. According to tsunami inundation zone maps as delineated by the California DOC (2022) and presented in Alameda County and Contra Costa County local hazard mitigation plans (Alameda County 2022; Contra Costa County 2018), no project areas are located within identified tsunami inundation zones.

Seiches

A seiche is the resonant oscillation of water generated in an enclosed body of water, such as San Francisco Bay, from seismic activity. Seiches are related to tsunamis for enclosed bays, inlets, and lakes. These tsunami-like waves can be generated by earthquakes, subsidence, or uplift of large blocks of land, submarine and onshore landslides, sediment failures, and volcanic eruptions. The strong currents associated with these events may be more damaging than inundation by waves. The largest seiche wave ever measured in the San Francisco Bay, following the 1906 earthquake, was four inches high. The Bay Area has not been adversely affected by seiches during its history within this seismically active region of California (USACE San Francisco District, Port of Oakland 2000).

5.10.1.6 Water Quality

As described previously, Sausal Creek is the only waterbody crossed by the project that is on the Clean Water Act Section 303(d) impaired waters list. Waterbodies downstream of the project that are on the Section 303(d) impaired waters list are shown in Table 5.10-1.

Table 5.10-1. Waterbodies Downstream of the Project Area on the Clean Water Act Section 303(d) Impaired Waters List

Waterbody Name	Integrated Report Category[a]	Pollutants Listed	Applicable TMDLs or Other Actions
Upper San Leandro Reservoir	Category 5	Mercury	-
Lake Chabot	Category 5	Chlordane, DDT, dieldrin, mercury, PCBs	-
Lower San Leandro Creek	Category 4a	Diazinon, trash	Diazinon (2012 TMDL), trash (NPDES MS4 permit)
Lake Merritt	Category 5	Organic enrichment/low dissolved oxygen, trash	-
Central San Francisco Bay	Category 5	Chlordane, DDT, dieldrin, dioxin compounds (including 2,3,7,8-TCDD), furan compounds, invasive species, mercury, PCBs, PCBs (dioxin-like), selenium, trash	Mercury (2008 TMDL), PCBs and PCBs (dioxin-like) (2010 TMDL), selenium (2016 TMDL)

[a] Integrated Report Category presented in SWRCB (2022)

DDT = dichlorodiphenyltrichloroethane
NPDES MS4 = National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System
PCBs = polychlorinated biphenyls
TMDL = total maximum daily load

The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) (RWQCB 2023) is the Board's master water quality control planning document for the San Francisco Bay Basin (refer to Section 5.10.2.2).

5.10.1.7 Groundwater Basin

The westernmost area of the project, west of approximately milepost 4.79 along the proposed underground route, is located within the East Bay Plain Sub-basin of the Santa Clara Valley Groundwater Basin (DWR 2004) as shown on Figure 5.10-1. Within the East Bay Plain Sub-basin, depths to groundwater in the Upper Shallow Aquifer Zone are less than 20 feet below ground surface (bgs) in most of the sub-basin (EBMUD GSA and City of Hayward GSA 2022). Groundwater flow in the sub-basin generally is east to west toward San Francisco Bay. Groundwater generally becomes shallower from west to east. Prior soil investigations along Park Boulevard within the East Bay Plain Sub-basin encountered water at or below 30 feet bgs (SWRCB 2024; also refer to Section 5.9.1.7). To the east of the East Bay Plain Sub-basin, most of the project area does not occur within an identified groundwater basin.

The Santa Clara Groundwater Basin is bounded by the Diablo Range to the east and the Santa Cruz Mountains to the west and consists of four sub-basins: the East Bay Plain, Niles Cone, Santa Clara, and San Mateo Plain sub-basins. The East Bay Plain Sub-basin is a northwest-trending alluvial plain bounded on the north and west by San Francisco Bay, on the east by the contact with Franciscan Basement rock in the East Bay Hills, and on the south by the Niles Cone Sub-basin. The East Bay Plain Sub-basin covered by the project area is entirely urban. Numerous creeks, including San Leandro Creek, San Lorenzo Creek, San Pablo Creek, and Wildcat Creek, flow from the western slope of the Coast Ranges westward across the plain and into the San Francisco and San Pablo Bays. The East Bay Plain Sub-basin aquifer system consists of unconsolidated sediments of Quaternary age. The primary water-bearing strata are three alluvial deposits, the early Pleistocene Santa Clara Formation, the late Pleistocene Alameda Formation, and the early Holocene Temescal Formation, and artificial fill (DWR 2004).

5.10.1.8 Groundwater Wells and Springs

No known public or private groundwater supply wells or springs were identified within 150 feet of the project area (EDR, 2024).

5.10.1.9 Groundwater Management

In 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) in response to continued overdraft of California's groundwater resources. The SGMA requires preparation of Groundwater Sustainability Plans (GSPs) to address measures necessary to attain sustainable conditions in groundwater basins and sub-basins in California, including the East Bay Plain Sub-basin. The EBMUD GSA and City of Hayward GSA were formed in 2016 and 2017, respectively, in response to the SGMA and together developed a GSP for the East Bay Plain Sub-basin (EBMUD GSA and City of Hayward GSA 2022). The goals of the East Bay Plain Sub-basin GSP are to achieve and maintain groundwater sustainability in the sub-basin through 2042 and beyond. Specifically, the GSP outlines measures to manage the sub-basin in a manner that avoids significant and unreasonable depletion of groundwater supply (chronic lowering of groundwater levels) and significant and unreasonable reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and reduction in beneficial uses of interconnected surface water. The GSP includes current and potential future monitoring projects for groundwater level and quality, surface water, and subsidence; emergency extraction wells; irrigation with groundwater; use of groundwater to supplement flows into San Leandro Creek; a well conversion study; and a conjunctive use study.

Groundwater use is limited in the East Bay Plain Sub-basin by several factors, including readily available high-quality imported surface water, existing high salts in shallow Bay margin groundwater, the potential for saltwater intrusion, and contamination in shallow aquifers (San Francisco Bay RWQCB Groundwater Committee 1999).

Groundwater in the project area has been affected by historical industrial and commercial uses; past contamination in soil and groundwater has been documented at several locations along the project route (refer to Section 3.8, Hazards, Hazardous Materials, and Public Safety).

5.10.2 Regulatory Setting

5.10.2.1 Federal

Clean Water Act Section 303(d)

Section 303(d) of the CWA (33 USC 1251-1376) requires states, territories, and authorized tribes to develop a list of impaired waters within their boundaries that do not meet water quality standards and objectives, even after point sources of pollution have installed the minimum required levels of pollution control technology. The Section 303(d) list is the state's list of impaired and threatened waters (stream/river segments, lakes). States are required to submit their lists for EPA consideration every 2 years. For each waterbody on the list, the state identifies the pollutant causing the impairment, when known. The law further requires that these jurisdictions establish priority rankings for waters on the list and develop action plans, called TMDLs, to improve water quality. The RWQCBs and the SWRCB implement this federal regulation in California.

Clean Water Act Section 401

Under CWA Section 401, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the United States unless a Section 401 water quality certification is issued or if certification is waived. States and authorized tribes where the discharge would originate generally are responsible for issuing water quality certifications. Major federal licenses and permits subject to Section 401 include CWA Section 402 and Section 404 permits issued by the EPA or USACE. In making decisions to grant, grant with conditions, or deny certification requests, certifying authorities consider whether the federally licensed or permitted activity will comply with applicable water quality standards, effluent limitations, new source performance standards, toxic pollutant restrictions, and other appropriate water quality requirements of state or tribal law.

Clean Water Act Section 402

Under CWA Section 402 (33 USC 1251 et seq.), the National Pollutant Discharge Elimination System (NPDES) controls water pollution by regulating point sources of pollution to waters of the U.S. The SWRCB administers the NPDES permit program in California. Projects that disturb 1 acre or more of soil are required to obtain coverage under the state NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit [CGP]). An SWPPP must be developed and implemented for each project covered by the CGP. The SWPPP must include BMPs that are designed to reduce potential impacts to surface water quality during project construction and operation.

Clean Water Act Section 404

CWA Section 404 establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States unless the activity is exempt from Section 404 regulation. No discharge of dredged or fill material may be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded.

National Flood Insurance Program

FEMA is responsible for determining flood elevations and floodplain boundaries based on USACE studies. FEMA also is responsible for distributing the FIRMs used in the NFIP (42 USC 50, Section 4102). These maps identify the locations of SFHAs, including 100-year floodplains. FEMA allows nonresidential development in the floodplain; however, FEMA has criteria to "… constrict the development of land which is exposed to flood damage where appropriate" and to "… guide the development of proposed construction away from locations which are threatened by flood hazards." Federal regulations governing development in a floodplain are set forth in 44 CFR Part 60, enabling FEMA to require municipalities that participate in the NFIP to adopt certain flood hazard reduction standards for construction and development in 100-year floodplains.

Oil Pollution Prevention Regulation

Originally published in 1973 under the authority of Section 311 of the CWA, the Oil Pollution Prevention regulation sets forth requirements for the prevention of, preparedness for, and response to oil discharges at specific nontransportation-related facilities that store oil at certain volume thresholds (total aggregate capacity of aboveground oil storage containers is greater than 1,320 gallons or completely buried storage tanks is greater than 42,000 gallons). The goal of this regulation (40 CFR 112) is to prevent oil from reaching navigable waters and adjoining shorelines and to contain discharges of oil. The regulation requires these facilities to develop and implement SPCC plans and establishes procedures, methods, and equipment requirements.

5.10.2.2 State

Porter-Cologne Water Quality Control Act (California Water Code, Division 7)

Under this state law, the SWRCB has authority over state waters and water quality. "Waters of the state" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code Section 13050[e]). Examples include rivers, streams, lakes, bays, marshes, mudflats, unvegetated and seasonally ponded areas, drainage swales, sloughs, wet meadows, natural ponds, vernal pools, diked baylands, seasonal wetlands, and riparian woodlands. The RWQCBs have local and regional authority. The San Francisco Bay RWQCB has authority in the project area. The RWQCBs prepare and periodically update Basin Plans (water quality control plans), which establish the following:

- Beneficial uses of water designated for each protected waterbody
- Water quality standards for both surface water and groundwater
- 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 if the discharge could affect the quality of waters of the state (Article 4, Section 13260). The RWQCB will issue waste discharge requirements or a waiver of the waste discharge requirements for the project. The requirements will implement any relevant water quality control plans that have been adopted and must take into consideration the beneficial uses to be protected and the water quality objectives reasonably required for that purpose (Article 4, Section 13263).

Fish and Game Code, Section 5650

This section of California law makes is unlawful to deposit in, to permit to pass into, or to place where it can pass into waters of the state specific pollutants or any substance or material deleterious to fish, plant life, mammals, or bird life.

Fish and Game Code, Section 1602

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

San Francisco Bay Basin Water Quality Control Plan

The objective of the San Francisco Bay Basin Plan (RWQCB 2023) is to guide how the quality of surface and groundwaters in the region should be managed. The Basin Plan identifies various beneficial water uses and the water quality that must be maintained to allow those uses to continue. The Basin Plan also describes an implementation plan necessary to achieve the standards established in the plan and summarizes SWRCB and RWQCB plans and policies to protect water quality. The San Francisco Bay RWQCB implements the plan by issuing and enforcing waste discharge requirements based on either state waste discharge requirements or federally delegated NPDES permits for discharges to surface water.

National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities

The SWRCB regulates stormwater discharges from construction sites to protect against the mobilization of pollutants into waterbodies or watersheds. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation. Dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities.

Urban Water Management Planning Act

California's DWR reviews submitted Urban Water Management Plans (UWMPs) that are prepared by urban water suppliers every 5 years. These plans support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. The requirements for UWMPs are found in California Water Code, Section 10608 and Section 10610 through Section 10656. Every urban water supplier that either provides more than 3,000 acre-feet of water annually or serves more than 3,000 urban connections is required to submit a UWMP. Urban water suppliers must meet the following criteria in their UWMPs:

- Assess the reliability of water sources over a 20-year planning time frame.
- Describe demand management measures and water shortage contingency plans.
- Report progress toward meeting a targeted 20 percent statewide reduction in per-capita (per-person) urban water consumption by the year 2020. EBMUD reported that it achieved its interim 2015 and 2020 water demand targets.
- Discuss the use and planned use of recycled water.

The information collected from the submitted UWMPs is useful for local, regional, and statewide water planning.

Sustainable Groundwater Management Act

In September 2014, legislation was passed to strengthen local management and monitoring of groundwater basins most critical to the state's water needs. The SGMA prioritizes groundwater basins that currently are overdrafted and sets a timeline for implementation:

- By 2017, local groundwater management agencies must be identified.
- By 2020, overdrafted groundwater basins must have sustainability plans.

- By 2022, other high- and medium-priority basins not currently in overdraft must have sustainability plans.
- By 2040, all high- and medium-priority groundwater basins must achieve sustainability.

The SGMA also provides measurable objectives and milestones to reach sustainability and a state role of limited intervention when local agencies are unable or unwilling to adopt sustainable management plans.

5.10.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

City of Orinda

The Conservation Element (Section 4.2 of the Environmental Resources Section) of the City of Orinda General Plan addresses creeks and drainage. Guiding policies related to creeks and drainage presented in this element include (Orinda 1987):

Guidance Policy E

- Policy: Protect creeks from siltation, pollution, and debris buildup to minimize the danger of flooding in storms, to retain the aesthetic and habitat values of the creeks in their natural state and enhance and restore them where possible. Prohibit major channelization.
- Policy Implementation: Preserve drainage easements along creeks to protect adjacent buildings from flooding, and to preserve valuable riparian vegetation. Where riparian vegetation has to be disturbed for construction, re-vegetation with local riparian species is required. The City shall develop design policies for development near creeks.

Guidance Policy H

- Policy: Protect San Pablo Reservoir and Briones Reservoir from pollution and siltation resulting from development within the Planning Area.
- Policy Implementation: Review development proposals to ensure site design and construction methods that minimize soil erosion and volume and velocity of surface runoff and mitigate impacts on properties below.

The *City of Orinda Safety Element* of the General Plan outlines flood and inundation hazards; Section 3.2 and defines goals and policies for those hazards. Flood and inundation goals and policies, as related to construction or development, include the following (Orinda 2023):

GOAL S-2: A community that seeks to avoid and minimize risk and damage from flood hazards in the city.

- Policy S-17 For new construction and proposals for substantial improvements to residential and nonresidential development within 100-year floodplains, as mapped by FEMA or as determined by site-specific hydrologic studies for areas not mapped by FEMA, the City of Orinda shall apply a minimum level of acceptable risk and disapprove projects that cannot mitigate the hazard to the satisfaction of the Building Official or other responsible agency. Areas outside of the 100-year floodplains should be considered for future risk because climate change may expand areas of the city that are currently considered flood prone.
- Policy S-18 Development on parcels containing or bordering the floodway shall only be allowed if the proposed structures can be adequately floodproofed and will not contribute to property

damage or risks to public safety. Such developments shall be required to be capable of withstanding flooding and minimize the use of fill. Compatible uses shall not, however, obstruct flows or adversely affect upstream or downstream properties with increased velocities, erosion backwater effects, or concentrations of flows.

- Policy S-20 Condition new development to maintain or minimize post-development peak runoff rate and average volume similar to predevelopment conditions, to the maximum extent feasible. Consider use of green infrastructure and low impact development that use on-site infiltration to slow runoff during peak periods. Where this is not feasible, the increase shall be mitigated.

Contra Costa County

Section 8.12 of the Contra Costa County General Plan (2005) addresses water resources and outlines related goals, policies, and implementation measures. Water resources implementation measures related to development include the following:

- 8-25. The County shall protect marshes, wetlands, and riparian corridors from the effects of potential industrial spills.
- 8-86. Existing native riparian habitat shall be preserved and enhanced by new development unless public safety concerns require removal of habitat for flood control or other public purposes.
- 8-91. Grading, filling, and construction activity near watercourses shall be conducted in such a manner as to minimize impacts from increased runoff, erosion, sedimentation, biochemical degradation, or thermal pollution.
- 8-cy. Through the environmental review process, the likely effects of construction and other proposed activities on nearby natural watercourses and related open space shall be determined. Measures shall be identified that will mitigate these effects and encourage the preservation of natural waterways and related open space.

Section 10.8 of the Contra Costa County General Plan identifies flood hazards and outlines goals, policies, and implementation measures related to those hazards. Flood hazard implementation measures related to construction or development include the following:

- 10-y. Through the environmental review process, ensure that potential flooding impacts, due to new development, including on-site and downstream flood damage, subsidence, dam or levee failure, and potential inundation from tsunamis and seiche, are adequately assessed. Impose appropriate mitigation measures.
- 10-ab. Prohibit new structures which would restrict maintenance or future efforts to increase the height of the levees from being constructed on top or immediately adjacent to the levees.

City of Oakland

The Safety Element of Oakland's General Plan outlines hydrology and flooding hazards and defines the following goals and polices related to minimizing flooding hazards (Oakland 2023):

GOAL SAF-3: Protect people and property from flooding.

- SAF-3.1 Minimize Storm Induced Flooding. Continue or strengthen city programs that seek to minimize the storm-induced flooding hazard.
- SAF-3.2 Storm-Induced Flooding Structural Risk. Enforce and update local ordinances, and comply with regional orders, that would reduce the risk of storm-induced flooding.

City of Piedmont

The Environmental Hazards Element of the City of Piedmont's General Plan (2020) includes the following policies on flooding risk and hazardous materials:

- Policy 19.5: Keeping Flood Hazards Low. Maintain Piedmont's low potential for flooding through storm drain maintenance, preservation of creeks and drainage courses in their natural state, and periodic clearing of debris from storm drains and catchment basins. Ensure that new development does not increase the risk of off-site flooding, either in Piedmont or downstream in Oakland.
- Policy 19.6: Managing Runoff. Ensure that runoff from individual properties is directed in a way that does not threaten adjacent properties. Runoff should be directed to places where it can be absorbed into the ground, detained in rain barrels or cisterns, or directed toward storm drains.
- Policy 20.1: Hazardous Material Handling, Storage, and Disposal. Require that the handling, storage, and disposal of hazardous materials complies with all applicable local, county, state, and federal laws. Where appropriate, clearance from the Piedmont Fire Department should be required before businesses licenses are issued.

5.10.3 Impact Questions

The project's potential effects on hydrology and water quality were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.10-2 and discussed in more detail in Section 5.10.4.

Table 5.10-2. CEQA Checklist for Hydrology and Water Quality

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 or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
i. Result in substantial erosion or siltation on- or off-site	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site	☐	☐	☐	☒
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐

Table 5.10-2. CEQA Checklist for Hydrology and Water Quality

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
iv. Impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

5.10.3.1 Additional CEQA Impact Questions

None.

5.10.4 Potential Impact Analysis

The following subsections describe significance criteria for hydrology and water quality impacts derived from Appendix G of the CEQA Guidelines; provide APMs; and assess potential project-related impacts on hydrology and water resources during the construction and operation and maintenance phases.

5.10.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project-related impacts on hydrology and water quality resources were evaluated for each of the criteria listed in Table 5.10-2, as discussed in Section 5.10.4.4.

5.10.4.2 Applicant-Proposed Measures

Several APMs discussed in Section 5.9, Hazards, Hazardous Materials, and Public Safety, will help prevent the project from creating environmental contamination from the use of hazardous materials in project activities or the offsite migration of hazardous materials or environmental contamination during construction that could affect water quality. These include APM HAZ-1 to develop and implement hazardous material and emergency response procedures; APM HAZ-2 to provide emergency spill supplies and equipment at the project site during construction to contain, collect, and dispose of any minor spills; APM HAZ-4 to develop and implement a worker environmental awareness training program to communicate environmental concerns and appropriate work practices to all construction field personnel; and APM HAZ-5 to segregate, test, and appropriately dispose of contaminated soils or groundwater. In addition, the project will implement the following APMs:

APM HYD-1. Prepare and Implement a SWPPP. Stormwater discharges associated with project construction activities are regulated under the CGP. Cases in which construction will disturb more than 1 acre of soil require submittal of a Notice of Intent, development of an SWPPP (both certified by the Legally Responsible Person), periodic monitoring and inspections, retention of monitoring records, reporting of incidences of noncompliance, and submittal of annual compliance reports. PG&E will comply with all CGP requirements for construction of project components.

Following project approval, PG&E will prepare and implement an SWPPP, which will address erosion and sediment control concerns to minimize construction impacts on surface water quality, as well as reduce the potential for stormwater runoff to impact adjacent properties. The SWPPP will be designed specifically for the hydrologic setting of the proposed project (surface topography, storm drain configuration, and other factors). Implementation of the SWPPP will help stabilize graded areas and reduce erosion and sedimentation. The SWPPP will propose BMPs that will be implemented during construction activities. Erosion and sediment control BMPs – such as straw wattles, erosion control blankets, and silt fences – will be installed in compliance with the SWPPP. Suitable soil stabilization BMPs will be used to protect exposed areas during construction activities, as specified in the SWPPP. During construction activities, BMPs will be implemented to reduce exposure of construction materials and wastes to stormwater. BMPs will be installed following manufacturer's specifications and according to standard industry practice.

Erosion and sediment control measures may include the following:

- Straw wattle, silt fence, or gravel bag berms
- Trackout control at all entrances and exits
- Stockpile management
- Effective dust control measures
- Good housekeeping measures
- Stabilization measures, which may include wood mulch, gravel, and seeding

Identified erosion and sediment control measures will be installed prior to the start of construction activities and will be inspected and improved as required by the CGP. Temporary sediment control measures intended to minimize sediment transport from temporarily disturbed areas such as silt fences or wattles will remain in place until disturbed areas are stabilized. In areas where soil is to be temporarily stockpiled, soil will be placed in a controlled area and will be managed using industry-standard stockpile management techniques. Where construction activities occur near a surface waterbody or drainage channel, the staging of construction materials and equipment and excavation spoil stockpiles will be placed and managed in a manner to minimize the risk of sediment transport to the drainage. Any surplus soil will be transported from the site and disposed of in accordance with federal, state, and local regulations.

The SWPPP will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials will be permitted, if necessary. A copy of the SWPPP will be provided to CPUC for recordkeeping. The plan will be maintained and updated during construction as required by the CGP.

APM HYD-2. Worker Environmental Awareness Program. The worker environmental awareness program will be developed and provided separately to CPUC staff prior to construction. The worker environmental awareness program will communicate environmental issues and appropriate work practices specific to project components to all field personnel. These will include spill prevention and response measures and proper BMP implementation. A copy of the worker environmental awareness program record will be provided to CPUC for recordkeeping at the completion of the project. An environmental monitoring program also will be implemented to ensure that the plans are followed throughout the construction period for project components.

APM HYD-3. Project Site Restoration. As part of the final construction activities, PG&E will restore all removed curbs and gutters, repave, and restore landscaping or vegetation, as necessary.

5.10.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

Project impacts related to hydrology and water quality were evaluated against the CEQA significance criteria, as discussed in the following sections. Potential project impacts from the construction phase and the operations and maintenance phase are evaluated. For impacts to federally protected wetlands and other sensitive natural communities, refer to Section 5.4.

a) **Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? *Less-than-Significant Impact*.**

The project will not violate any water quality standards or waste discharge requirements. Project structures, temporary work areas, and construction access have been sited to avoid surface water, including waterways and wetlands. The project will have no direct impact on riparian habitats or wetlands, as described in Section 5.4. The rebuilt alignment crosses over one waterbody, Sausal Creek, that is listed on the Section 303(d) impaired waters list for the pollutant category of trash. No trash generated by project construction will be discharged from project work areas. Several waterbodies downstream of the project area are also on the Section 303(d) list, as described in Section 5.10.1.6. These downstream waterbodies are greater than 1 mile from the project area. Wastewater generated during construction will be contained within portable restrooms and disposed of by a licensed contractor. Construction staging areas will include berms and other methods to contain excess water applied for dust control, concrete wash water, and similar liquid construction wastes. Concrete washout stations will be established within staging and laydown areas to contain the washout. No wastewater will be discharged from the project work areas.

Known or potentially contaminated sites are located near the proposed project alignment (refer to Section 5.9, Hazards, Hazardous Materials, and Public Safety). In addition, unknown sites of contaminated soil could be present. Groundwater is not expected to be encountered during excavations, so dewatering is not expected to be needed. However, if groundwater were encountered, water quality could be affected if pre-existing contaminated groundwater is exposed and contacts uncontaminated soil and groundwater during construction, or if contaminant mobility is enhanced as a result of the construction process (cross-contaminating soil during excavation, breaching of a confining layer, or transporting contaminated spoils). However, any potential impacts will be temporary and limited by the scale of construction activities. In addition, as described in APM HAZ-5, groundwater will be collected during construction, contained, tested, and disposed of in accordance with all applicable regulations. Containment will be done by pumping the groundwater into holding tanks. Noncontaminated groundwater will be released to the stormwater drainage system in the area (with prior approval). If the groundwater is contaminated, it will be disposed of at a facility that accepts liquid hazardous waste, in accordance with applicable regulations. Implementation of APM HAZ-5, as well as the worker environmental training program described in APM HYD-2, will reduce the likelihood of cross-contamination and restrict contaminant mobility, further reducing this less-than-significant impact.

Potential impacts during project construction include erosion, increased runoff and sedimentation, and release of hazardous materials from construction equipment and vehicles. Construction activities conducted during the rainy season have the potential for increasing erosion and sediment transport locally. Most soil disturbance during project construction will occur during excavation and trenching for installation of the underground portion of the project, including vaults and conduits. Small, temporary stockpiles of excavated soil may be located near an excavation to be used for backfill. Excavation and trenching for the underground power lines will occur within paved roadways where nearby stormwater catch basins will be protected per the SWPPP. Limited soil disturbance will occur during replacement of overhead structure foundations, most of which will be installed using micropiles. Other overhead structure foundations will be drilled-shaft reinforced concrete piers installed using drill rigs; these foundations have a small footprint, up to approximately 8 feet in diameter. For guard structures, holes will be augered for wooden poles.

Similarly, limited soil disturbance will occur during removal of existing structures. Typically, the same access and staging for replacement structure installation will be used for removal of the corresponding existing structures. Existing structures will be disassembled and sections will be lifted out by helicopter or crane to the ground to be cut into smaller sections for transport, or structures will be cut and removed piece by piece by hand and carried out by hand. Existing foundations will be removed, including all concrete and steel typically 3 feet bgs, unless cutting them off below the ground surface will increase environmental impacts or a landowner prefers to keep the foundation in place on the property. Limited soil disturbance also will occur from vehicle movement and similar activities at pull and tension sites, structure work areas, staging areas, and along temporary access routes.

PG&E will develop an SWPPP based on site-specific soil characteristics and slope to address potential water quality concerns, as described in APM HYD-1. The SWPPP will specify measures for activities with the potential to degrade surrounding water quality through erosion, sediment runoff, and the presence of other pollutants. Fiber rolls will be placed on downslopes of all work areas and when in proximity of creeks/channels.

Accidental releases of hazardous materials that are used during construction – for example, diesel fuel, hydraulic fluid, or oils and grease – will have the potential to occur. An accidental release of fuel or lubricant at the surface or within excavations poses minimal risk to groundwater quality, given the small amounts of material used, depth to groundwater, and spill response procedures, as described in Section 5.9. Potential impacts will be further minimized by implementing APM HYD-1 and by APM HAZ-1, which is discussed in Section 5.9.4.3.1. The SWPPP measures will be implemented and monitored throughout the project's construction by a qualified SWPPP practitioner.

The project is not expected to use or store large quantities of hazardous materials. Fuel, grease, and fluids needed for equipment operation will be onsite periodically; these will be handled, in keeping with APM HYD-1, APM HYD-2, and APM HAZ-1 for proper use, storage, and cleanup (if warranted).

In summary, during construction the potential impact under this criterion is associated with an accidental non-stormwater discharge or impairment of water quality through disturbance of pre-existing contaminated soil or groundwater, which are expected to be minimal, and any impacts will be further minimized with implementation of APM HYD-1, APM HYD-2, APM HAZ-1, and APM HAZ-5. Therefore, the project is not expected to violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality; the potential impact will be less than significant.

No changes in operation and maintenance activities are anticipated with implementation of the project. Therefore, there will be no impacts associated with operation and maintenance.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? *Less-than-Significant Impact*.

A maximum of approximately 8,000 gallons of water will be needed daily for dust suppression. It is anticipated that water will be sourced from local municipal sources close to the project area, which generally do not include groundwater. Groundwater is not expected to be encountered during excavations, and dewatering is not expected to be needed. In the unlikely event that groundwater is encountered, dewatering activities will be temporary and have very localized effects on groundwater levels. There will be no impact on the groundwater table level beyond this very localized and minor effect. It is anticipated that water for construction, primarily for dust control, will be sourced from local municipal sources close to the project area that obtain their water from EBMUD. Depending on availability and distance to active construction, PG&E may supplement project water needs by using recycled water available from EBMUD's main wastewater treatment plant in West Oakland, which may only be used in EBMUD's service area.

Construction of the project will result in a negligible increase in impervious area. Existing structure foundations will either be left in place or will be removed to approximately 3 feet bgs, backfilled, and compacted. Foundations for replacement structures will be limited in size. The underground portion of the rebuilt power lines will be in an existing paved street that will be repaved following construction. All work within Moraga and Oakland X substations will occur within existing buildings and structures. Existing unpaved areas in the vicinity of these activities will not experience any significant modification from that already existing. Staging areas and existing unpaved access roads may require minor improvement such as blading the surface of the area, compacting soil, and applying gravel. Scraping and grading during preparation of some project work areas and staging areas may disturb the soil surface, which will result in a temporary reduction in the infiltration and absorption capacity of the localized affected area. Localized compaction of soil from construction activities, including the use of heavy equipment, also could diminish the stormwater infiltration capacity. The effects will be localized to the project areas and create a minor reduction in groundwater recharge potential in comparison to the recharge ability of surrounding land.

Operation and maintenance activities for the project will be the same as current operation and maintenance activities and will not use groundwater or interfere with groundwater recharge. Therefore, project impacts on groundwater supply and recharge will be less than significant.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site? *Less-than-Significant Impact*.

As described in Impact b), project construction will result in a negligible increase in impervious area. The project will not alter streams or rivers. During construction of the project, some grading improvements will be made to existing unpaved roads for construction vehicle access within the project area. Very limited grading may be needed in some project work areas and staging areas for equipment access. The grading will not alter drainage patterns in the area. Appropriate dust control and SWPPP measures will be implemented at project work areas, staging areas, and access as described in APM AIR-1 and APM HYD-1. As described in APM HYD-3, site restoration at the end of construction will replace vegetation, which will help minimize any post-construction erosion, and will replace curb and gutter in the underground portion of the project. The impact to existing drainage patterns or streams or rivers that will result in substantial erosion or siltation on- or off-site will be less than significant.

No changes in operation and maintenance activities are expected with implementation of the project. Therefore, no impact will occur during construction or operation and maintenance.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? *No Impact*.

As described above, project construction will result in a negligible increase in impervious area and will not alter site drainage. No alteration to existing drainage patterns or streams or rivers will occur that will result in on- or off-site flooding. No changes in operation and maintenance activities are expected with implementation of the project. Therefore, no impact will occur during construction or operation and maintenance.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? *Less than-Significant Impact*.

Construction activities will not create or contribute runoff water that will exceed the capacity of existing or planned stormwater drainage systems. Water will be used conservatively during construction and will be limited to the minimum needed for dust control such that runoff into offsite locations is not expected. Sources such as gasoline, diesel, oil, hydraulic fluid, antifreeze, transmission fluid, and lubricating grease from construction equipment that could contribute to polluted runoff during construction will be managed onsite to prevent runoff. PG&E construction workers will receive training and have material at work areas to respond if a spill or release occurs to avoid or minimize runoff from work areas (refer to APM HAZ-1, APM HAZ-2, and APM HAZ-4). Construction activities have the potential to minimally increase runoff of stormwater contaminated with sediments or other pollutants if stormwater contacts materials onsite and discharges contaminants into storm drains. Potential sources of pollution include oil leaked from heavy equipment and vehicles, grease, hydraulic fluid, fuel, construction materials and products, waste materials, and erosion of disturbed soil. Construction staging areas will include berms and other methods to contain excess water applied for dust control, concrete wash water, and similar liquid construction wastes. Concrete washout stations will be established within staging and laydown areas to contain the washout. Excavation activities will be required for installation of vaults and conduits in the underground portion of the project. Limited soil disturbance will occur during removal of existing structure foundations and during construction of replacement structure foundations, the majority of which will be installed using micropiles. Other overhead structure foundations will be drilled-shaft reinforced concrete piers installed using drill rigs; these foundations have a small footprint, up to approximately 8 feet in diameter. For guard structures, holes will be augered for wooden poles. Existing unpaved access roads will be graded as needed. Structural BMPs such as water bars and rolling dips will be installed within the road prism as needed to ensure proper drainage off the road. In addition, staging and work areas may require minor improvement such as blading the surface of the area, compacting soil, and applying gravel. During construction, the project will control construction site runoff through the development and implementation of the SWPPP (refer to APM HYD-1 and APM HYD-2). As discussed above, construction activities will result in a negligible change in impervious areas and are not expected to increase runoff.

Limited water will be used for dust control during construction activities in Oakland and Piedmont and will have a negligible effect on the capacity of the cities' stormwater systems. The project's ground-disturbing activities within rural Contra Costa County will occur where municipal or otherwise developed stormwater collection systems are not established.

Project activities will have a less than-significant impact to existing or planned stormwater drainage systems, including the potential for providing substantial additional sources of polluted runoff, given that activities are temporary and limited by the scale of construction activities. The implementation of APM HYD–1, APM HYD-2, APM HAZ–1, APM HAZ-2, and APM HAZ-4 will further reduce potential less-than-significant impacts.

No changes in operation and maintenance activities are expected with implementation of the project. Therefore, no impact will occur during operation and maintenance.

iv. Impede or redirect flood flows? *No Impact*.

Other than one existing project access road (Wilder Road) to the northwest of Moraga Substation that crosses an upper tributary of San Pablo Creek, which is identified as subject to a 1 percent annual chance flood (Figure 5.10-3), no project areas are located within an identified SFHA or FEMA flood zone. The existing road will be used for temporary access during construction, and nothing will be stored or placed on the road. Transport of workers and equipment along this existing road will not result in impediments or redirections of floodwaters. Standard BMPs such as straw wattles or gravel bag berms will be installed along Wilder Road where needed to ensure that runoff from project construction does not reach San Pablo Creek. Therefore, no impact will occur during construction or operation and maintenance phases.

v. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? *No Impact*.

There is one existing project access road (Wilder Road) to the northwest of Moraga Substation that crosses an upper tributary of San Pablo Creek, which is identified as subject to a 1 percent annual chance flood (Figure 5.10-3). The existing road will be used for temporary access during construction, and nothing will be stored or placed on the road. No project areas are located within an identified SFHA or FEMA flood zone. The project is not located in tsunami or seiche zones and will not risk release of pollutants from inundation. Furthermore, the SWPPP and spill prevention and response measures will further reduce the risk of release of pollutants during construction. Therefore, there will be no impact from potential risk for release of pollutants from project inundation caused by flood hazard during construction or operation and maintenance phases.

d) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? *Less-than-Significant Impact*.

The project area is in the San Francisco Bay region, which is covered by the water quality control plan (Basin Plan) for the San Francisco Bay RWQCB (RWQCB 2023). This plan was last updated in March 2023. The project components do not include any waste discharges that could conflict with the Basin Plan. Activities associated with project construction, including as-needed surface contouring of some access roads and minor improvements of project work areas and staging areas, will not introduce substantial additional sources of polluted runoff. As described previously, an SWPPP will be prepared and implemented to further reduce any impacts, as described in APM HYD-1. The project's water use during construction and operation and maintenance will not deplete or interfere with groundwater supply or recharge. The project will not conflict with or obstruct implementation of the East Bay Plain Sub-basin Groundwater Sustainability Plan (EBMUD GSA and City of Hayward GSA 2022). Therefore, the project will not conflict with or obstruct the water quality control plan or a sustainable groundwater management plan, and the potential impacts during construction and operation and maintenance will be less than significant.

5.10.4.4 CPUC Draft Environmental Measures

None.

5.11 Land Use and Planning

This section describes existing conditions and potential impacts on land use resources as a result of construction, operation, and maintenance of the project. The analysis concludes that no impacts to land use will occur. The project's potential effects on land use resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.11-3 and discussed in more detail in Section 5.11.4.

5.11.1 Methodology and Environmental Setting

5.11.1.1 Methodology

Aerial photographs, area plans, land use maps, zoning ordinances, and redevelopment plans were reviewed for all areas traversed by the project.

Further analysis of land use and planning included a review of the following plans and policies:

- City of Orinda General Plan
- City of Orinda Zoning Ordinance
- Contra Costa County General Plan
- Contra Costa County Zoning Ordinance
- EBMUD Range Resource Management Plan
- EBMUD Low Effect East Bay Habitat Conservation Plan (HCP)
- CDFW Natural Community Conservation Planning (NCCP) program
- East Bay Regional Park District Master Plan
- East Bay Municipal Utility District East Bay Watershed Master Plan
- City of Oakland General Plan
- City of Oakland Zoning Ordinance
- City of Piedmont General Plan
- City of Piedmont Zoning Ordinance

In addition, field visits to the site were conducted in September 2023 to gather relevant information pertaining to the land uses at the project site and surrounding areas. Meetings between PG&E and applicable agencies were conducted and are summarized in Section 2.2.

5.11.1.2 Regional Land Use Setting

The project will be in the City of Orinda and unincorporated areas of western Contra Costa County for the eastern project section, in the City of Oakland for the central and western project sections, and in the City of Piedmont for a small portion of the western section (refer to Figure 3.1-1). The East Bay hills define most of the project area; the topography is flatter at the western end of the project area. The project vicinity includes dense urban development with residential, commercial, industrial, and institutional uses; moderately dense housing in the hills; and a range of local and regional parks and open spaces, especially in the eastern section of the project. In addition to the East Bay hills, major geographic features in the project vicinity include Sibley Volcanic Regional Preserve, Huckleberry Botanic Regional Preserve, Shephard Creek in Shepherd Canyon Park, SR 13, the Hayward Fault, Sausal Creek in Dimond Park, and Interstate (I-) 580. Elevation ranges from approximately 140 feet above sea level at the western end of the project, to approximately 1,370 feet above sea level in the central and eastern sections of the project, to approximately 650 feet above sea level at the eastern end of the project.

5.11.1.3 Local Land Use Setting (Existing Land Use)

The project boundary includes locations of the existing and replacement structures (all but two [RS27A, RS27B] of which are in existing PG&E ROW), work areas for staging and construction, and existing and new access to reach these areas from public roadways. The power lines from Moraga Substation to the intersection of Park Boulevard and Estates Drive, approximately 4 miles, will be rebuilt overhead within the existing ROW, other than RS27A/B. These two transition structures are located on City of Oakland property, where PG&E will obtain an easement. From these transition structures, the last approximately 1-mile of power lines will be rebuilt in an underground configuration located in franchise in Estates Drive in the City of Piedmont and in Park Boulevard and Park Boulevard Way in the City Oakland before connecting into Oakland X Substation. The existing overhead power lines rebuilt as underground will be removed after the rebuilt lines are in service. Major land uses, as determined using general plan designations and satellite imagery, were identified within 1,000 feet of the project boundary. The major land uses are summarized as follows.

- City of Orinda: Gateway Valley Planning Area (56 percent); residential (22 percent); and utilities (22 percent) (Orinda 2005).
- Contra Costa County: parks and recreation (83 percent); agricultural lands (7 percent); watershed (7 percent); and public and semi-public (3 percent) (Contra Costa County 2021).
- City of Oakland: residential (82 percent); resource conservation, parks, and open space (13 percent); institutional, including schools (4 percent); and neighborhood mixed use (1 percent) (Oakland 2023a).
- City of Piedmont: residential (97 percent) and schools/churches (3 percent) (note that 100 percent of area is designated residential land use in the General Plan) (Piedmont 2020).

Local Land Use Intersecting the Proposed Project

From the eastern end of the proposed project at the existing PG&E Moraga Substation on Lost Valley Drive in Orinda, the rebuilt lines will follow an approximately 5-mile-long southwestward path with an approximately 100- to 250-foot-wide ROW that currently terminates into the existing PG&E Oakland X Substation. The ROW passes through several planning jurisdictions, including the City of Orinda, Contra Costa County, the City of Piedmont, and City of Oakland. In addition, the EBRPD and EBMUD own and have jurisdiction over lands in unincorporated Contra Costa County and engage in land use planning activities.

Within the City of Orinda, land use along the power lines is designated as Utility at and near PG&E Moraga Substation and Gateway Valley Planning Area along the alignment within the city boundaries (City of Orinda 1987). The Gateway Valley Planning Area subsequently designated the area as Open Space (Orinda Gateway L.L.C. 2005). Existing land uses that intersect the project footprint consist of utility (Moraga Substation and power lines) and open space with recreation trails and dirt access roads.

Within Contra Costa County, land use along the power lines is designated as either Watershed or Parks and Recreation (Contra Costa County 2005). Land use at the temporary work areas near SR 24 is designated primarily as Parks and Recreation, with small areas of Public and Semi-Public and Agricultural Lands. Existing land uses that intersect the project footprint consist of open space with recreational trails, parking areas, and dirt and paved roads.

Within the City of Oakland, land use along the power lines is designated as Mixed Housing Type Residential, Neighborhood Center Mixed Use, Hillside Residential, Institutional, Resource Conservation, and Urban Park and Open Space (City of Oakland 2023a). Existing land uses that intersect the project footprint consist of residential (primarily single-family with a small amount of multi-family); parks and open space, including Shepherd Canyon Park, Dimond Park, and a golf facility; utilities, including PG&E Oakland X Substation; churches and schools; and a small amount of commercial land.

Within the City of Piedmont, land use along the power lines is designated as Low-Density Residential (City of Piedmont 2020). Existing land uses that intersect the project footprint consist of single-family residential, a church, and an associated school.

In accordance with CPUC request, a preliminary list of parcels within 1,000 feet of the project and retained alternatives, including the Assessor's Parcel Number, mailing address, and the parcel's physical address, is provided in Appendix 1A.

Parks and Open Spaces

Parks and open space under several jurisdictions are in the eastern section of the project.

EBMUD owns undeveloped land near PG&E Moraga Substation that is part of its watershed lands. Immediately west of this is open space managed under a CE by the Wildlife Heritage Foundation, a Section 501(c)(3) nonprofit dedicated to protecting and enhancing wildlife habitat in California. It is planned for the CEs to be transferred to EBMUD.

The Huckleberry Botanic Regional Preserve, administered by EBRPD, was established to protect a native plant community that is only found in a few locations along California's coast (EBRPD 2023a). Refer to Section 5.4, Biological Resources, for more information on this plant community. The preserve includes an interpretive loop hiking trail and other trails that connect to regional hiking trails, as well as restroom, parking, and picnic facilities. The power lines pass over the easternmost segment of the interpretive trail.

The Sibley Volcanic Regional Preserve, administered by EBRPD, provides a self-guided tour of round-top volcanoes as well as other trails for hiking, biking, and horseback riding; restroom, drinking water, and parking facilities; and a backpack campground (EBRPD 2021). The Sibley Backpack Campground has two walk-in (0.2 mile) primitive campsites for a maximum of 15 campers, along with two tent pads, two picnic tables, and a pit toilet (EBRPD 2023b).

In 2018, EBRPD amended its Sibley Volcanic Preserve Land Use Plan and certified the Final Environmental Impact Report for incorporating adjacent open spaces into Sibley Volcanic Regional Preserve (EBRPD 2018). The amendment includes, in the McCosker planning subarea, restoration of Alder Creek and Leatherwood Creek, which was completed in 2023; expansion of existing staging (parking) areas; improvements to existing roadways and utilities; construction of three vehicle bridges over Alder Creek; expansion of the trail system; and development of a combined group camp/ interpretive destination site for up to 50 people with restrooms, interpretive and picnic facilities, parking, and operations facilities. The group camp and some proposed trails are near the alignment of the power lines.

Shepherd Canyon Park is a public park located in the City of Oakland. It is located just east of SR 13 and extends for approximately one-half mile along Shephard Creek. The 34-acre park contains trails, including the Montclair Railroad Trail; sports fields; a picnic area; and a playground (Oakland Parks and Recreation Foundation 2023b). The 1.5-mile paved multi-use Montclair Railroad Trail extends from the northern end of Shepherd Canyon Park south and east to Montclair Village. The project alignment runs through a portion of the western edge of the park. Dimond Park/Dimond Canyon is a public park located in the City of Oakland. It is a linear park extending from SR 13 south approximately 1.2 miles along Sausal Creek. Hiking trails extend the length of the park, including through Dimond Canyon. Additional park facilities are located in the southern portion of the park and include basketball courts, tennis courts, a swimming pool, playgrounds, and picnic tables (Oakland Parks and Recreation Foundation 2023a). The existing power lines are located on PG&E land owned in fee that crosses the northern portion of the park and several recreational trails.

Water Conveyance and Flood Control Facilities

In the eastern section of the project, the power lines pass through an EBMUD-owned parcel of land. No EBMUD water or wastewater facilities are located on the parcel.

Regional Transportation Systems

The proposed project spans one major regional roadway, SR 13, between proposed structures RN21/RS21 and RN22/RS22. SR 13 is managed by Caltrans.

PG&E Oakland X Substation is approximately 400 feet north of I-580, which also is managed by Caltrans. The project area does not cross I-580.

Zoning and General Plan Land Use Designations

Figure 5.11-1 illustrates the zoning designations traversed by the project and within a 1,000-foot buffer of the project. Figure 5.11-2 illustrates the General Plan land use designations within 1,000 feet of the project area.

Public utility facilities regulated by the CPUC are not subject to local land use and zoning regulations. However, the General Plan land use and zoning designations for land on which the proposed project is located are described in Table 5.11-1. Note that the overlays for the City of Oakland apply to portions of the city's land use and zoning designations.

Table 5.11-1. Land Use and Zoning Designations Intersected by the Proposed Project

Jurisdiction	General Plan Land Use Designation	Zoning Designation
City of Orinda[a]	Utility	Public, Semipublic, and Utility
	Gateway Planning Area	Planned Development
Contra Costa County[b]	Parks & Recreation	A-2 General Agriculture A-80 Exclusive Agriculture
	Public and Semi-Public	A-2 General Agriculture A-80 Exclusive Agriculture
	Agricultural Lands	A-2 General Agriculture
City of Oakland[c]	Detached Unit Residential	Detached Unit Residential-1, -2 Overlay S-13, Affordable Housing
	Hillside Residential	Hillside Residential-3, -4 Overlays S-9, Fire Safety Protection; S-10, Scenic Route; S-11, Site Development and Design Review
	Institutional	Hillside Residential-3 Overlays S-9, Fire Safety Protection; S-10, Scenic Route
	Mixed Housing Type Residential	Mixed Housing Residential-2, -3, -4; Detached Unit Residential-2 Overlay S-13, Affordable Housing
	Neighborhood Center Mixed Use	Neighborhood Commercial-1 Overlay S-13, Affordable Housing
	Resource Conservation	Open Space (Linear Park), Open Space (Resource Conservation Area) Overlays S-9, Fire Safety Protection; S-10, Scenic Route
	Urban Park and Open Space	Open Space (Resource Conservation Area), Open Space (Special Use Park)
City of Piedmont[d]	Low Density Residential	Zone A – Single Family Residential

[a] City of Orinda 1987, 2023.

[b] Contra Costa County 2021, 2023.

[c] City of Oakland 2023a, 2023b.

[d] City of Piedmont 2020, 2023.

City of Orinda Zoning and General Plan Land Use Designations

The *City of Orinda General Plan* describes the Utility land use designation as PG&E and EBMUD lands that are of sufficient size to warrant differentiation from adjacent land uses. Watershed, open space, and public recreational uses also are considered appropriate uses in the Utility designation (City of Orinda 1987).

The *Gateway Valley Specific Plan* was approved by the City of Orinda in 2005 to detail land uses in the planning area (Orinda Gateway L.L.C. 2005). This plan identifies the area within the project boundary as open space. According to Section 19.7.2 of the City of Orinda Municipal Code, major and minor utilities are permitted in the Public, Semipublic, and Utility zone subject to a use permit (City of Orinda 2022). The Planned Development zoning is intended to establish a more-appropriate procedure for the development of large parcels of land in both residential areas and downtown because zoning standards and procedures were designed primarily for small parcels.

Contra Costa County Zoning and General Plan Land Use Designations

Contra Costa County describes the Parks and Recreation land use designation as publicly owned park facilities, as well as both public and private golf courses. Appropriate uses in this designation are passive and active recreation-oriented activities and ancillary commercial uses such as snack bars or restaurants.

The Watershed land use designation applies to lands owned by the two major water suppliers in the county, EBMUD and Contra Costa Water District. Only a very limited number of uses, including low-intensity recreational uses such as hiking and biking, are allowed in Watershed areas to safeguard public water supplies.

The Agricultural Lands designation includes most of the privately owned rural lands in the county, with the intent to preserve and protect lands capable of and generally used for the production of food, fiber, and plant materials. It does not exclude or limit other types of agricultural, open space, or non-urban us es such as landfills.

The Public and Semi-Public designation includes properties owned by public governmental agencies, including transportation corridors such as highways. A wide variety of public and private uses are allowed by this designation; however, construction of private residences or private commercial uses and subdivision of land are not considered compatible with this designation (Contra Costa County 2005).

Agricultural zoning designations overlap with several General Plan land use designations. The A-2 General Agriculture zoning designation allows all types of agriculture, including general farming and livestock production, and associated buildings and structures. Land uses in the A-2 zoning district that are allowed with the use permit include publicly owned parks (Contra Costa County 2023). The A-80 Exclusive Agriculture similarly allows for all types of agriculture and, with a land use permit, uses such as wineries and wholesale nurseries; however, lots must be a minimum of 80 acres (Contra Costa County 2023).

City of Oakland Zoning and General Plan Land Use Designations

The City of Oakland describes the land uses along the project alignment and the associated zoning as follows (City of Oakland 2023b, 2023c):

- The Detached Unit Residential land use designation is intended to create, maintain, and enhance residential areas characterized by a mix of single-family homes, small multi-unit buildings, and neighborhood businesses where appropriate, up to 15 units per gross acre. The Detached Unit Residential zoning supports the land use by identifying permitted activities and facilities and establishing property development standards. "Utility and vehicular" is a conditionally permitted activity; telecommunications facilities are among the conditionally permitted facilities.
- The Hillside Residential land use designation maintains residential uses on hillsides up to 5 units per gross acre. The Hillside Residential-3 and -4 zoning designations are intended to create, maintain,

and enhance residential areas that are primarily characterized by detached structures on hillside lots with lot sizes of at least 12,000 square feet and 6,500 to 8,000 square feet, respectively. The zoning identifies permitted activities and facilities and establishes property development standards. "Utility and vehicular" is a conditionally permitted activity; telecommunications facilities are among the conditionally permitted facilities.

- The Institutional land use designation has a primary use of educational, cultural, and medical up to an 8.0 floor area ratio. Under certain conditions, mixed-use housing and commercial development that supports institutional areas may be allowed, up to 125 units per gross acre.
- The Mixed Housing Type Residential land use designation is intended to create, maintain, and enhance residential areas typically located near the City's major arterials and characterized by a mix of single-family homes, townhouses, small multi-unit buildings, and neighborhood businesses where appropriate, with a density of up to 35 units per gross acre. Mixed Housing Residential-3 and -4 zoning categories are intended to create, maintain, and enhance residential areas typically located near the City's major arterials and characterized by a mix of single-family homes, townhouses, small multi-unit buildings, and neighborhood businesses where appropriate and at higher densities. The zoning identifies permitted activities and facilities and establishes property development standards. "Utility and vehicular" is a conditionally permitted activity; telecommunications facilities are among the conditionally permitted facilities.
- The Neighborhood Center Mixed Use land use designation is intended to identify, create, maintain, and enhance mixed-use neighborhood commercial centers. These centers typically are characterized by smaller-scale, pedestrian-oriented, continuous street frontage with a mix of retail, housing, office, active open space, eating and drinking places, personal and business services, and smaller scale educational, cultural, or entertainment uses.
- The Resource Conservation land use designation is intended to conserve open space areas; no buildings are permitted except as required to facilitate the maintenance of conservation areas.
- The Urban Park and Open Space land use designation is intended to support active and passive recreation. Open Space zoning is intended to create, preserve, and enhance land for permanent open space to meet the active and passive recreational needs of Oakland residents and to promote park uses that are compatible with surrounding land uses and the city's natural environment. Electric, gas, and telephone distribution lines and poles are allowed with a Minor Conditional Use Permit.

The project alignment passes through several combining zone overlays, as noted in Table 5.11-1. These are defined as follows (City of Oakland 2022, 2023b):

- S-9, Fire Safety Protection Combining Zone, is intended to promote the public health, safety, and welfare by ensuring that activities and facilities that are located, in whole or in part, within or adjacent to Very High Fire Hazard Severity Zones (as designated by the California Department of Forestry and Fire Protection) and accessed from streets that are less than 26 feet in width at any point or cul-de-sacs that do not meet emergency access standards, develop in such a manner as not to be a serious threat to public health or safety. It establishes prohibitions on the number of accessory dwelling units (ADUs) per lot and requires off-street parking for allowed ADUs.
- S-10, Scenic Route Combining Zone, is intended to create, preserve, and enhance areas where hillside terrain, wooded canyons and ridges, and fine vistas or panoramas of Oakland, neighboring areas, or the Bay can be seen from the road., This combining zone typically is appropriate to roads along or near ridges, or through canyons, of the Oakland Hills that have good continuity and relatively infrequent vehicular access from abutting properties. It establishes design review criteria, restrictions on driveway access on certain roads, and downslope building height limits, among other requirements.
- S-11, Site Development and Design Review Combining Zone, is intended to create, preserve, and enhance areas subject to the *North Oakland Hill Area Specific Plan* adopted by the City Council and to

assure that development there is sensitively integrated with the land forms, view corridors, and vegetation masses. It establishes design review criteria and limits on residential development.

- S-13, Affordable Housing Combining Zone, is intended to create and preserve affordable housing restricted for extremely low-, very low-, low-, and moderate-income households. It is an optional program to allow a bonus height for eligible affordable housing projects.

City of Piedmont Zoning and General Plan Land Use Designations

The City of Piedmont Low Density Residential land use denotes areas developed at densities ranging from three to eight units per gross acre. Single family homes and related accessory structures are permitted, as well as uses stipulated by state law. This designation corresponds to Piedmont's Zone "A," which has a 10,000 square foot minimum lot size (City of Piedmont 2020).

Local Plans and Policies

As previously stated, the PG&E project components are not subject to local agency regulations. However, PG&E has considered the local plans and policies described in the following sections in its design of the proposed project. The project's consistency with particular policies within these documents is discussed in Section 5.11.4.

General Plans

The cities of Oakland, Orinda, and Piedmont and Contra Costa County have adopted general plans as required by the state of California that provide a framework for future land use, growth, and other local decisions regarding circulation systems, open spaces, and facilities. The state of California requires cities and counties to adopt zoning ordinances to implement their general plans. The plans address the requirement for new infrastructure and utilities to accommodate new growth. The general plan land uses and zoning that apply to the land within the project alignment are discussed in Section 5.11.1.3.5.

Airport Land Use Plan

The nearest airports to the project site are Oakland International Airport (OAK) and Hayward Executive Airport (HWD). OAK, initially constructed in 1927, is a primary commercial service airport owned and operated by the Port of Oakland, providing commercial passenger, general aviation, and cargo services. In 2019, OAK accommodated approximately 13.4 million annual passengers and approximately 242,000 total aircraft operations (takeoffs and landings) by passenger airlines, cargo airlines, general aviation aircraft, and military (Port of Oakland 2023). OAK is located approximately 5.5 miles south of the project's southernmost point (Oakland X Substation). The project site is located outside the OAK AIA (ACCDA 2010).

HWD was constructed in 1942 as an army airfield; the City of Hayward assumed operational control in 1947. The airport provides general aviation services; in 2019, the airport had a total of 116,753 aircraft operations (FAA 2023). HWD is located approximately 10 miles southeast of the project's southernmost point (Oakland X Substation). The project site is located outside the Hayward Executive Airport AIA (ACCDA 2012).

The proposed project will comply with Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace, for the construction and operation of the proposed project. Airport hazards are discussed further in Section 5.9, Hazards and Hazardous Materials.

5.11.1.4 Special Land Uses

The project alignment crosses open space and recreation lands administered by EBMUD, EBRPD, the City of Oakland, and the Wildlife Heritage Foundation. These lands are described in Section 5.11.1.3.2. The replaced, modified, and removed structures located on these lands are identified in Table 5.11-2.

Table 5.11-2. Special Land Uses

Structure	Land Administration	Approximate Distance from PG&E Moraga Substation (miles)
EN3, ES3, RN3, RS3	Wildlife Heritage Foundation	0.4
RN4, RS4	Wildlife Heritage Foundation	0.5
RN5, RS5	EBMUD	0.6
EN6, ES7, RN6, RS6	EBRPD	0.8
EN7, ES8, RN7, RS7	EBRPD	0.9
ES8A&B	EBRPD	1.0
EN8, ES9, RN8, RS8	EBRPD	1.1
EN9, ES10, RN9, RS9	EBRPD	1.3
EN19, ES21, RN18, RS18	City of Oakland	2.9
EN20, ES22	City of Oakland	3.0
RS27A, RS27B	City of Oakland	4.0

RN3, RS27A, and RS27B are expected to require modification or new easement rights, respectively.

The proposed project does not impact any coastal zones, designated or proposed candidate national or state wild and scenic rivers, or national landmarks.

5.11.1.5 Habitat Conservation Plan

The CDFW's California NCCP map shows no adopted HCPs or NCCPs in the project vicinity (CDFW 2023).

PG&E has the Bay Area Operations & Maintenance HCP (PG&E 2017) for its O&M activities in the San Francisco Bay Area. This HCP is applicable to O&M activities for PG&E's electric and gas transmission and distribution systems, ROWs (plus standard buffers), lands owned by PG&E or subject to PG&E easements, access routes, and mitigation areas acquired to mitigate for impacts resulting from covered activities within the nine counties of the San Francisco Bay Area, including Alameda and Contra Costa Counties. The HCP pertains to the construction rebuild, which is a maintenance activity, and to the continuation of routine O&M inspection and maintenance activities of the rebuilt power lines. Refer to Section 5.4, Biological Resources, for additional information regarding the PG&E Bay Area Operations & Maintenance HCP.

The CDFW's California NCCP map shows no other adopted HCPs or NCCPs in the project vicinity (CDFW 2023).

EBMUD prepared its Low Effect East Bay HCP to support its request for an Incidental Take Permit for two plant and five animal species (EBMUD 2008). The project is not located in the area covered by the EBMUD HCP.

5.11.2 Regulatory Setting

The following sections identify federal, state, and local laws, policies, and standards for land use and planning.

5.11.2.1 Federal

Habitat Conservation Plans

Section 10 of the FESA allows for the creation of HCPs to protect listed and candidate species in connection with the issuance of an Incidental Take Permit for federally listed species (refer to Section 5.4). PG&E's Bay Area Operations & Maintenance HCP provides coverage under the incidental take provisions of Section 10 of the FESA for PG&E O&M activities within the nine-county San Francisco Bay Area. The project is a maintenance project and is included within the boundaries of this HCP area.

5.11.2.2 State

The CPUC has exclusive jurisdiction over the design, siting, installation, operation, maintenance, and repair of electric transmission facilities, pursuant to Article XII, Section 8 of the California Constitution. The CPUC is the Lead Agency for CEQA review for this project and has authority over the discretionary project approval that PG&E seeks.

5.11.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) land use and zoning regulations or discretionary permits except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local land use plans and policies are considered for informational purposes and to assist with the CEQA review process. Local regulation of land use and planning is codified in the City of Oakland General Plan, City of Orinda General Plan, City of Piedmont General Plan, and Contra Costa County General Plan.

Although PG&E is not subject to local discretionary permitting, ministerial permits will be secured, as required. Table 3.10-1 (in Chapter 3, Project Description) lists the authorizations that may be required for project construction.

5.11.3 Impact Questions

5.11.3.1 Impact Questions

The project's potential effects on land use and planning were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.11-3 and discussed in more detail in Section 5.11.4.

Table 5.11-3. 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) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

5.11.3.2 Additional CEQA Impact Questions

None.

5.11.4 Potential Impact Analysis

Project impacts related to land use were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase. An analysis of impacts to adjacent land uses during construction and operation of the project is included in other sections of this PEA, including Aesthetics, Air Quality, Hazards and Hazardous Materials, Noise, Recreation, and Transportation and Traffic.

5.11.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. In accordance with Appendix G of the CEQA Guidelines, the potential significance of project impacts on land use and planning were evaluated for each of the criteria listed in Table 5.11-3, as discussed in Section 5.11.4.3.

5.11.4.2 Applicant-Proposed Measures

The project will have no impact on land use and planning and no land use APMs are included. However, several APMs discussed in other sections will reduce any nuisances to nearby properties and people. These include APM AIR-1, which includes measures to control dust during construction; APM NOI-1, which details how PG&E will provide written notice at least 1 week prior to planned construction activities to all sensitive receptors and residences within approximately 500 feet of construction sites, as well as providing contact information for a project public liaison to receive and respond to concerns; and APM TRA-1, which will provide temporary traffic controls to prevent excessive congestion or traffic hazards during construction.

5.11.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) Would the project physically divide an established community? *No Impact*.

The project will rebuild an existing electrical utility for the region. No PG&E project features or other built components will be implemented that will otherwise introduce a new barrier that physically divides an established community. Implementation of this project, including construction and operation and maintenance, will not physically divide an established community, and no impact will occur.

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? *No Impact*.

As stated previously, the PG&E project components will not be subject to local discretionary land use or planning regulations. According to the documentation review and analysis conducted, the proposed PG&E project components will not conflict with the existing City of Oakland General Plan, City of Orinda General Plan, City of Piedmont General Plan, or Contra Costa County General Plan. PG&E's project activities will not impede the implementation of the applicable plans or the corresponding avoidance or mitigation of environmental effects. The replaced power lines will be in the existing ROW, which includes PG&E property owned in fee and existing or modified easements, with the westernmost mile rebuilt in nearby franchise rights and one new easement from the City of Oakland to locate RS27A and RS27B. The rebuilt power lines will follow generally in the same path as the existing power lines between the substations. The location of the power lines rebuilt overhead will not change relative to the surrounding communities. Approximately 1.20 mile of existing overhead lines will be removed after being rebuilt underground. PG&E will negotiate easement modifications on PG&E easements to reflect uses of the replaced lines (vegetation rights, access rights, roadway with existing utility use, etc.). The O&M personnel will continue to visit the project periodically for routine inspection and maintenance procedures. The O&M occurring where the power lines are rebuilt underground will occur at a similar frequency to the current inspections for the replaced overhead portion. This infrequent activity will have no impact on land use.

Because of the compatible uses of electric lines with the zoning in the project area, no conflict with existing zoning will occur. Specifically:

- According to Schedule (Table) 17.9.2 of the City of Orinda Municipal Code, major and minor utilities are permitted in the Public, Semipublic, and Utility zone subject to a use permit.
- The project will not conflict with or prevent the allowed uses, including agricultural uses, in the A-2 zoning.
- As discussed in Section 5.11.1.3.5, utilities are either a conditionally permitted activity or are not listed as prohibited in all the City of Oakland zones listed in Table 5.11-1, per the City of Oakland Municipal Code. The project also is consistent with the combining zone overlays discussed in Section 5.11.1.3.5.
- The City of Piedmont Low Density Residential land use designation allows uses stipulated by state law.

The project is not located within 2 miles of private airports or airstrips.

The rebuilt PG&E lines will continue to span Alder Creek, Leatherwood Creek, Sausal Creek, and Shephard Creek. All project structures will be well outside the banks of the creeks. No impact will occur.

The rebuilt PG&E lines will continue to span SR 13. Guard structures and netting will be used to prevent construction activities from interfering with the use of SR 13. As part of the permitting process, PG&E will consult with Caltrans to modify existing or obtain required land rights. PG&E will comply with all design guidelines and land rights, including those related to highway crossings. No impact will occur.

Because local agencies do not have jurisdiction over PG&E's project components, and no state or federal land use plans, policies, or regulations are applicable, the PG&E project components will not conflict with any applicable land use policy, plan, or regulation. Nonetheless, an evaluation was performed, and the impact analysis demonstrates that the project is compatible with the general plans adopted by the cities of Oakland, Orinda, Piedmont, and Contra Costa County and will not have an impact on plans or policies. No changes in land use or zoning will be required as part of the project. No impact will occur.

c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan? *No Impact.*

PG&E has the Bay Area Operations & Maintenance HCP for its O&M activities in the San Francisco Bay Area (PG&E 2017). This HCP is applicable to O&M activities for PG&E's electric transmission and distribution systems. It is currently implemented for the existing power lines and will continue to be implemented for the rebuilt lines.

No other HCPs or NCCPs apply to the project area; no impact will occur.

5.12 Mineral Resources

This section describes existing conditions and potential impacts on mineral resources as a result of construction, operation, and maintenance of the project. The analysis concludes that the proposed project will have no impact on mineral resources. The project's potential effects on mineral resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.12-2 (located in Section 5.12.3) and discussed in more detail in Section 5.12.4.

5.12.1 Methodology and Environmental Setting

Information on mineral resources was compiled from local plans, published literature, and maps. Mineral resource classifications and locations were obtained by reviewing the California Geological Survey (CGS) and California Division of Mine Reclamation (DMR) maps and special reports. Online maps from sources, including the Mineral Land Classification Studies Index (DOC 2021), the MOLMines MapServer web portal (DMR 2023a), and Mines Online (DMR 2023b), were reviewed to check for the presence of active mining claims, active mines, resource recovery sites, and mineral resources within 0.5 mile of the project footprint. General Plans for Contra Costa County, the City of Orinda, the City of Oakland, and the City of Piedmont were reviewed for information on locally important mineral resources.

No active mining claims, active mines, or resource recovery sites are known within 0.5 mile of the project. The nearest active mining operation is a rock quarry in Clayton, California, approximately 12 miles away from the project, and a stone quarry in Richmond, California, approximately 13 miles away from the project (DMR 2023a, DMR 2023b, Contra Costa 2023, Richmond 2012).

The CGS publication Special Report 146 and the updated Open File Report 96-03 identify the Oakland East Quadrangle as a regionally significant aggregate resource area in the south San Francisco Bay Production-Consumption Region (Kohler-Antablin 1996; Stinson and Manson 1987). The mapping associated with Special Report 146 shows that the project alignment overlaps with all four types of mineral resource zones (MRZs), as shown in Table 5.12-1 (Stinson and Manson 1982). Figure 5.12-1 shows the project alignment overlaid on the MRZs. In the western and central portions of the alignment, which includes MRZ-1 and MRZ-2, the land use is residential. In the eastern portion, which includes MRZ-3 and MRZ-4, the land is open space or parkland.

Table 5.12-1. Mineral Resource Zones in Project Alignment

Mineral Resource Zone	Definition of Mineral Resource Zone[a]	Approximate Length in Project Alignment
MRZ-1	Areas where available geologic information indicates that little likelihood exists for the presence of significant mineral resources.	5,250 feet
MRZ-2(b)	Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists. This zone is applied to known mineral deposits or where well-developed lines of reasoning, based upon economic-geologic principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is high.	10,400 feet
MRZ-3(a)	Areas containing known or inferred mineral occurrences of undetermined mineral resource significance. The (a) indicates that these are Leona Rhyolite deposits that lack sufficient material to meet the significant threshold of value.	550 feet
MRZ-4	Areas where available information is inadequate to assign any other classification.	15,050 feet
Unlabeled	Not applicable.	1,150 feet

[a] From Stinson, M., and Manson, M. 1982.

5.12.1.1 Orinda Mineral Resources

There are no active mining sites within the City of Orinda; however, one former rock quarry is in the southwestern portion of the city, east of State Route 24 (City of Orinda 2022). According to the *City of Orinda General Plan*, the Orinda planning area contains two area that may be designated by the State Mining and Geology Board as resource sectors for construction aggregate. The City of Orinda, however, has officially protested the possible designation of those sites as significant regional mineral resources; the General Plan policies prohibit mineral resource extraction (City of Orinda 1987). The City of Orinda 2022 Draft EIR states that there are not any significant mineral resources within its boundaries (City of Orinda 2022).

5.12.1.2 Contra Costa County Mineral Resources

In the early 20th century to the late 20th century, mineral resources in Contra Costa County were a valuable commodity for the continued economic vitality of the County. According to the *Contra Costa County General Plan* Housing Element Update EIR, Contra Costa County mineral resources consist of aggregate and stone, including a regionally significant deposit of diabase near Mt. Zion and Clayton (Contra Costa County 2023). The *Contra Costa County General Plan* Conservation Element identifies the important resources currently mined in the County to include crushed rock near Mt. Zion in the Concord area, shale in the Port Costa area, and sand and sandstone deposits mined from several locations, but primarily focused in the Byron area of the southeast part of the County (Contra Costa County 2020). Several regionally significant mineral resource deposits of andesite and basalt are within 0.5 mile of the project near the City of Moraga and a small ridge southwest of the City of Orinda (Contra Costa County 2023).

5.12.1.3 Oakland Mineral Resources

The *City of Oakland General Plan* Open Space and Conservation Element notes that, early in the city's development, volcanic deposits (rhyolite) were mined in quarries and open pits in the hills of Oakland (City of Oakland 1996). The most recently active of these was the 128-acre Leona Quarry that has been reclaimed and redeveloped as residential land and open space (DMR 2023a, 2023b).

5.12.1.4 Piedmont Mineral Resources

According to the *City of Piedmont General Plan* Natural Resources and Sustainability Element, the principal mineral resources are volcanic rock. Basalt, andesite, and rhyolite were mined during the East Bay's early development, but Piedmont's quarries were converted to other uses and the area became more urbanized (City of Piedmont 2009). The General Plan states that the State Mining and Geology Board does not identify any regionally significant resources in the city, and mineral resource mining is not expected to resume anywhere in the city because of the residential buildup and lack of suitable sites (City of Piedmont 2009).

5.12.2 Regulatory Setting

5.12.2.1 Federal

No federal regulations related to mineral resources are applicable to the project.

5.12.2.2 State

The California Surface Mining and Reclamation Act (SMARA) of 1975 requires that the State Geologist classify land into MRZs according to the known or inferred mineral potential of the land (Public Resources Code Sections 2710 to 2796). The current mineral land classification report for the area, Special Report 199 (Smith and Clinkenbeard 2012), which is an update of predecessor Special Report 160 (Jensen and Silva 1989), confirms that the mineral land classification categories that were current when

Special Report 160 was developed were still valid for the updated report. The MRZs that intersect the project are shown in Table 5.12-1.

5.12.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

City of Orinda

The *City of Orinda General Plan* Environmental Resources Element includes the following guiding policy regarding mineral resources (City of Orinda 1987).

- Prohibit mineral resource extraction except as it is incidental to grading for development, safety, or recontouring of previously quarried areas. Quarrying and mining would be destructive to the environment of Orinda.

Contra Costa County

Chapter 8, Conservation Element, of the *Contra Costa County General Plan* contains the following policies related to mineral resources (Contra Costa County 2005).

- Policy 8-54: Mining and quarrying shall be a permitted use in certain privately owned areas which are in an open space designation in the General Plan (e.g., Open Space, Agricultural lands, etc.) and which contain known mineral deposits with potential commercial value. These deposits include, but are not limited to, rocks, gravel, sand, salt, and clay.
- Policy 8-56: Incompatible land uses shall not be permitted within the mineral resource impact areas identified as containing significant sand and gravel deposits (as shown on Figure 8-4 of the General Plan).
- Policy 8-57: Incompatible uses are defined as land uses inherently incompatible with mining and/or uses that require high public or private investment in structures, land improvements, and landscaping that prevent mining because of the higher economic value of the land and its improvements.
- Policy 8-58: Future development in the vicinity of valuable mineral resource zones shall be planned and designed to minimize disturbance to residential areas or other sensitive land uses and to permit the safe passage of quarry trucks.
- Policy 8-59: Development of compatible land uses shall be encouraged within 1,000 feet of the quarrying sites. Compatible uses include secondary activity related to the quarry operation, recreation facilities, parks, agricultural uses, and permanent open space.

City of Oakland

The *City of Oakland General Plan* Open Space, Conservation, and Recreation (OSCAR) Element identifies the following objectives and policies regarding mineral resource extraction (City of Oakland 1996):

- Objective CO-3 Mineral Resources: To conserve mineral resources and minimize the environmental impact of mineral extraction.

City of Piedmont

The City of Piedmont does not include any policies or objectives regarding mineral resources within its General Plan Natural Resources and Sustainability Element (City of Piedmont 2006).

5.12.3 Impact Questions

5.12.3.1 Impact Questions

The project's potential effects on mineral resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.12-2 and discussed in more detail in Section 5.12.4.

Table 5.12-2. 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?	☐	☐	☐	☒

5.12.3.2 Additional CEQA Impact Questions

None.

5.12.4 Potential Impact Analysis

Project impacts related to mineral resources were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.12.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b), the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on mineral resources were evaluated for each of the criteria listed in Table 5.12-2, as discussed in Section 5.12.4.

5.12.4.2 Applicant-Proposed Measures

The project will have no impact on mineral resources, so no Applicant-proposed measures are proposed.

5.12.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

Project components that could potentially affect mineral resources include installation of structure foundations and grading of access roads.

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state? *No Impact*.

While a large portion of the project area overlaps with MRZs designated by SMARA, there are no known active mining claims or active mining operations within 0.5 mile of the project, within Contra Costa County or the cities of Orinda, Piedmont, or Oakland. The portion of the project alignment within MRZ-2 has existing residential land use and will not be mined. There are no plans for mining in residential areas or designated open space/parkland areas. Therefore, loss of availability of a known mineral resource of value to the region and residents of the state will not occur; therefore, no construction or operation and maintenance impacts will occur.

b) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? *No Impact.*

The Contra Costa County General Plan EIR identifies some areas within 0.5 mile of the project as having significant mineral resources. There is an MRZ-2(c) approximately 0.29 mile from the project alignment, an MRZ-2(d) approximately 0.14 mile from the alignment, and an MRZ-3(d) approximately 0.24 mile from the project alignment in the eastern section of the project (Stinson and Manson 1982). In unincorporated Contra Costa County, the project directly overlaps with MRZ-1, MRZ-4, and an area unlabeled on the Mineral Lands Classification Map (Stinson and Manson 1982). The project is approximately 12 miles from the closest active mining site. The General Plans for the cities of Orinda, Piedmont, and Oakland do not designate any locally important mineral resource recovery sites within 0.5 mile of PG&E's portion of the project. However, the Mineral Land Classification Map identifies approximately 6,550 feet of the overhead portion and approximately 3,850 feet of the underground portion of the project to fall within MRZ-2(b) (Stinson and Manson 1982). There are no active mining sites within the cities of Orinda, Piedmont, or Oakland. The project will not result in the loss of availability of a locally important mineral resource recovery site; therefore, no construction or operation and maintenance impacts will occur.

5.13 Noise

This section describes existing conditions and potential noise impacts associated with construction, operation, and maintenance of the project. The analysis concludes that impacts from construction, while substantial are temporary and less than significant and operational noise impacts will be less than significant. The APMs described in Section 5.13.5.2 will reduce potential temporary construction impacts. The project's potential noise-related effects were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.13-19 and discussed in more detail in Section 5.13.4.

5.13.1 Methodology and Environmental Setting

This section describes methodology and environmental setting.

5.13.1.1 Methodology

Evaluation of potential noise impacts from the project included developing predictions of noise from project construction activities, reviewing county and city noise standards that would assist with the environmental review, characterizing the existing noise environment, and predicting noise levels and related impacts during construction. Operation and maintenance of the project will entail the same type of activities as existing operation and maintenance and is discussed qualitatively.

Fundamentals of Noise

Noise generally is defined as loud, unpleasant, unexpected, or undesired sound that typically is associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual. Airborne sound is the fluctuation of air pressure above and below atmospheric pressure. Several ways exist to measure sound, depending on the source, receiver, and reason for the measurement.

Community sound levels generally are presented in terms of A-weighted decibels. The A-weighting network measures sound in a similar fashion to how a person perceives or hears sound, thus achieving a strong correlation with how people perceive acceptable and unacceptable sound levels.

A-weighted sound levels typically are measured or presented as the equivalent sound pressure level (L_{eq}), which is defined as the average noise level on an equal-energy basis for a stated period and commonly is used to measure steady-state sound that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements typically are denoted by Ln, where "n" represents the percentile of time that the sound level is exceeded. Therefore, L_{90} represents the noise level that is exceeded during 90 percent of the measurement period, which typically represents a continuous noise source. Similarly, L_{10} represents the noise level exceeded for 10 percent of the measurement period.

Table 5.13-1 presents A-weighted sound levels and the general subjective responses associated with common sources of noise in the physical environment.

Table 5.13-1. Typical Sound Levels Measured in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet flyover at 1,000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher in the next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 2013

dBA = A-weighted decibel(s)

Another metric used in determining the impact of environmental noise is people's responses to differences in daytime and nighttime noise levels. During the evening and at night, exterior background noises generally are lower than daytime levels. However, most household noise also decreases at night, and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to evening and nighttime noise levels, the day-night sound level (L_{dn}) (also referred to as DNL) and the community noise equivalent level (CNEL) were developed. The L_{dn} is a noise metric that accounts for the greater annoyance of noise during the nighttime hours (10:00 p.m. to 7:00 a.m.). The CNEL is a noise index that accounts for the greater annoyance of noise during both the evening hours (7:00 p.m. to 10:00 p.m.) and nighttime hours.

L_{dn} values are calculated by averaging hourly L_{eq} sound levels for a continuous 24-hour period on an energy basis, applying a weighting factor of 10 decibels (dB) to the nighttime values. CNEL values are calculated similarly, except that a 5-dB weighting factor also is added to evening L_{eq} values. The applicable adjustments, which reflect the increased sensitivity to noise during evening and nighttime hours, are applied to each hourly L_{eq} sound level for the calculation of L_{dn} and CNEL. For the purposes of assessing noise, the 24-hour day is divided into three time periods, with the following adjustments:

- Daytime hours: 7:00 a.m. to 7:00 p.m. (12 hours)—adjustment of 0 dBA
- Evening hours (for CNEL only): 7:00 p.m. to 10:00 p.m. (3 hours)—adjustment of +5 dBA
- Nighttime hours (for both CNEL and L_{dn}): 10:00 p.m. to 7:00 a.m. (9 hours)—adjustment of +10 dBA

The hourly adjusted time-period noise levels then are averaged (on an energy basis) to compute the overall L_{dn} or CNEL value. For a continuous noise source, such as a transformer, the L_{dn} value can be computed by adding 6.4 dBA to the overall 24-hour noise level (L_{eq}). For example, if the expected continuous noise level from a noise source is 60.0 dBA, the resulting L_{dn} from the source will be 66.4 dBA. Similarly, the CNEL for a continuous noise source is computed by adding 6.7 dBA to the overall 24 hour L_{eq}.

The general human response to changes in noise levels that are similar in frequency content (such as comparing increases in continuous [L_{eq}] traffic noise levels) are summarized as follows:

- A 3-dB change in sound level is considered a barely noticeable difference.
- A 5-dB change in sound level typically is noticeable.
- A 10-dB increase is considered a doubling in loudness.

Sound attenuates with distance. The farther one is from the source, the lower the sound level will be. For sources of noise that may be represented by a point source, such as a piece of construction equipment, the sound generally will decrease at a rate of 6 decibels per doubling of distance. For line sources (such as continuous traffic on a roadway), the sound level generally will decrease at a rate of 3 decibels per doubling of distance. At larger distances, atmospheric absorption and other factors may provide additional reductions beyond those provided by distance alone.

Construction Equipment Noise Levels

Typical noise levels generated by the construction equipment listed in the project description have been calculated previously and published in various reference documents. The expected equipment noise levels listed in the FHWA *Roadway Construction Noise Model User's Guide* (User's Guide) (FHWA 2006) were used for this evaluation. The User's Guide provides the most recent comprehensive assessment of noise levels from construction equipment. Table 5.13-2 provides typical noise levels and usage factors for general construction equipment and activities consistent with the FHWA Roadway Construction Noise Model. The acoustical usage factor does not equate to the percentage of time the equipment is in use, but rather the percentage of time that it is operated at its maximum sound emission level.

Table 5.13-2. Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Specified L_{max} at 50 feet (dBA)	Calculated L_{eq} at Specified Distance (dBA)			
			100 feet	200 feet	500 feet	1,000 feet
Auger Drill Rig	20	85	72	66	58	52
Backhoe	40	80	70	64	56	50
Bar Bender	20	80	67	61	53	47
Boring Jack Power Unit	50	80	71	65	57	51
Chain Saw	20	85	72	66	58	52
Clam Shovel (dropping)	20	93	80	74	66	60
Compactor (ground)	20	80	67	61	53	47
Compressor (air)	40	80	70	64	56	50
Concrete Batch Plant	15	83	69	63	55	49
Concrete Mixer Truck	40	85	75	69	61	55
Concrete Pump Truck	20	82	69	63	55	49
Concrete Saw	20	90	77	71	63	57
Crane	16	85	71	65	57	51
Dozer	40	85	75	69	61	55
Drill Rig Truck	20	84	71	65	57	51
Drum Mixer	50	80	71	65	57	51
Dump Truck	40	84	74	68	60	54
Excavator	40	85	75	69	61	55
Flat Bed Truck	40	84	74	68	60	54

Table 5.13-2. Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Specified L_{max} at 50 feet (dBA)	Calculated L_{eq} at Specified Distance (dBA)			
			100 feet	200 feet	500 feet	1,000 feet
Front End Loader	40	80	70	64	56	50
Generator	50	82	73	67	59	53
Generator (less than 25 kVa)	50	70	61	55	47	41
Gradall	40	85	75	69	61	55
Grader	40	85	75	69	61	55
Grapple (on backhoe)	40	85	75	69	61	55
Horizontal Boring Hydraulic Jack	25	80	68	62	54	48
Hydra Break Ram	10	90	74	68	60	54
Impact Pile Driver	20	95	82	76	68	62
Jackhammer	20	85	72	66	58	52
Man Lift	20	85	72	66	58	52
Mounted Impact Hammer (hoe ram)	20	90	77	71	63	57
Pavement Scarifier	20	85	72	66	58	52
Paver	50	85	76	70	62	56
Pickup Truck	40	55	45	39	31	25
Pneumatic Tools	50	85	76	70	62	56
Pumps	50	77	68	62	54	48
Refrigerator Unit	100	82	76	70	62	56
Rivet Buster/Chipping Gun	20	85	72	66	58	52
Rock Drill	20	85	72	66	58	52
Roller	20	85	72	66	58	52
Sand Blasting (single nozzle)	20	85	72	66	58	52
Scraper	40	85	75	69	61	55
Shears (on backhoe)	40	85	75	69	61	55
Slurry Plant	100	78	72	66	58	52
Slurry Trenching Machine	50	82	73	67	59	53
Soil Mix Drill Rig	50	80	71	65	57	51
Tractor	40	84	74	68	60	54
Vacuum Excavator (vac-truck)	40	85	75	69	61	55
Vacuum Street Sweeper	10	80	64	58	50	44
Ventilation Fan	100	85	79	73	65	59
Vibrating Hopper	50	85	76	70	62	56
Vibratory Concrete Mixer	20	80	67	61	53	47
Vibratory Pile Driver	20	95	82	76	68	62
Warning Horn	5	85	66	60	52	46
Welder/Torch	40	73	63	57	49	43

Table 5.13-2. Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Specified L_{max} at 50 feet (dBA)	Calculated L_{eq} at Specified Distance (dBA)			
			100 feet	200 feet	500 feet	1,000 feet
All Other Equipment Greater than 5 Horsepower	50	85	76	70	62	56

kVa = kilovolt-ampere(s)
Leq = time-averaged sound level
Lmax = highest sound level measured during a single noise event

Construction Work Streams

Project construction consists of four types of work streams: (1) rebuild overhead lines, (2) rebuild western portion underground, (3) modify Moraga Substation, and (4) modify Oakland X Substation. The construction work streams may, at times, be happening concurrently. Refer to Table 3.3-1 in Chapter 3, Project Description.

For the rebuild overhead lines work stream, the primary work areas are at the discrete locations of the existing and new structures; refer to Figure 3.5-1. At a typical location, two structures will be removed and two structures will be assembled and installed. Each structure requires 1 to 2 days for removal and 1 to 2 days for installation; refer to Table 3.6-4. Therefore, with 1 to 2 days of site preparation, the construction duration at a typical location in this work stream will be up to 10 working days (2 calendar weeks). Transition structure installation will be of similar duration, approximately 2 to 3 (calendar) weeks, at those locations. Construction equipment that may be used at each location in this work stream includes chain saws, chippers, skid steers, excavators, dozers, drill rigs, bucket trucks, forklifts, flatbed trucks, generators, dump trucks, auger trucks, concrete mixer trucks, boom trucks, backhoes, and cranes. The equipment used at each location will vary, depending on site conditions and site access, among other factors. Helicopters will be used at specific locations in the eastern portion of the project. Additional information on helicopter use is provided later in this section.

For the rebuild western portion underground work stream, duct bank installation will be completed at a rate of 40 to 100 feet per day over its approximately 1.24-mile length. Therefore, a noise receptor along Park Boulevard will be within 1,000 feet of this construction activity for approximately 20 to 50 days. Construction at each vault will last approximately 2 weeks. Each of the approximately 10 vaults may be either sequentially constructed one after another or constructed at the same time per the future construction schedule. Refer to Table 3.6-4. Construction equipment that may be used at each location in this work stream includes chain saws, chippers, loaders, excavators, pile drivers, cranes, dump trucks, concrete mixer trucks, air compressors, rollers, tractors, generators, boom trucks, vacuum trucks, road graders, compactors, road paving machines, and street sweepers. In addition, to the underground work stream in the western portion, a small number of existing structures will be replaced and transition structures will be installed between Monterey Boulevard and Estates Drive as part of the overhead work stream. Construction equipment and duration at each of work areas will be similar to the rebuild overhead lines work stream. Existing structures replaced by the underground segment will be removed and not replaced after the underground segment is installed. Construction equipment at each of these structure removal work locations will be similar to what is used in the rebuild overhead lines work stream; however, the duration may be shorter, approximately 5 working days (1 week) at each work location.

Construction activities for equipment replacement for the modify Moraga Substation work stream will last approximately 4 months. The modify Oakland X Substation work stream will last approximately 6 months. However, other than trucks and forklifts to bring the new equipment to the substations and carry old equipment away, all equipment used is expected to be hand tools within the substation.

Cumulative Equipment Noise

As shown in Table 5.13-2, the loudest typical construction equipment generally emits noise in the range of 80 to 90 dBA at 50 feet. This assessment focuses on a typical level of 85 dBA at 50 feet with a usage factor of 40 percent. Noise at any specific receptor is dominated by the closest and loudest equipment. As previously noted, a wide range of equipment may be used at a given construction location but, as shown in Table 5.13-2, the sound levels from different construction equipment do not vary dramatically and 85 dBA at 50 feet with a 40 percent usage factor is considered representative. The types and numbers of construction equipment near any specific receptor location will vary over time. The exact equipment that will be used at a specific location has not been determined at this time. Therefore, to provide a conservative analysis, five pieces of the noisiest equipment are assumed to be in use in the same work area simultaneously.

As described by the Federal Transit Administration (FTA) (2018), the average noise level from each piece of equipment is determined by the following formula for geometric spreading:

$$\text{Typical Noise Level at 50 feet} + 10 * \log(\text{Adj}_{\text{usage}}) - 20 * \log(\text{distance to receptor}/50) - 10 * G * \log(\text{distance to receptor}/50)$$

Where:

Usage factor ($\text{Adj}_{\text{usage}}$) = 1 (equipment is operating continuously)

Ground effect factor (G) = 0, representing hard ground (such as a ground condition that does not result in additional attenuation)

The following assumptions were used for modeling construction noise:

- One piece of equipment generating a reference noise level of 85 dBA (at 50 feet distance with a 40 percent usage factor) located on the power line route
- Two pieces of equipment generating reference noise levels of 85 dBA located 50 feet farther away on the power line route (100 feet distance with a 40 percent usage factor)
- Two additional pieces of equipment generating reference noise levels of 85 dBA located 100 feet farther away on the power line route (200 feet distance with a 40 percent usage factor)

Table 5.13-3 presents construction equipment noise levels at various distances based on these assumptions.

Table 5.13-3. Construction Equipment Noise Levels Versus Distance

Distance from Construction Activity (feet)	L_{eq} Noise Level (dBA)
50	83
100	79
200	74
400	69
800	63
1,600	58
3,200	52
6,400	46

Refer to text narrative preceding this table for the assumptions of this noise modeling scenario.

Pile Driving Noise

Pile driving may be used to install temporary excavation shoring walls during vault installation activities for the rebuild western portion underground work stream. Driven piles may result in noise levels higher than specified in Table 5.13-2. In this pile-driving noise analysis, a noise level of 101 dBA at 50 feet from the equipment and a usage factor of 20 percent is assumed. As shown in Table 5.13-4, incorporating the 20-percent usage factor into consideration yields an average noise level of 94 dBA at 50 feet. Pile driving noise levels will be expected to decrease at a rate of 6 dBA per doubling of distance. Pile driving is typically a limited-duration activity during construction and will be scheduled to occur during daytime hours. Table 5.13-4 presents the predicted noise level from impact pile driving at various distances.

Table 5.13-4. Average Predicted Pile Driving Noise Levels

Distance from Pile Driver (feet)	Noise Level (dBA)
50	94
100	88
200	82
400	76
800	70

Helicopter Operations

Helicopter use is proposed in the eastern section of the project as part of the conductor stringing operation and to support construction survey staking; lifting or transporting of structure components; crew transport to towers; and lifting of equipment for installation of towers. PG&E estimates that a helicopter will be used on the project for approximately 30 days (for an average of 5 to 6 hours per day) during construction, primarily supporting the activities described previously. Helicopters generally will be staged and fueled at existing local airports, such as Oakland International Airport, Hayward Executive Airport, Livermore Municipal Airport, or Buchanan Field Airport. However, a fuel truck may be available at project staging areas to support refueling if needed. Helicopter temporary landing zones will be colocated with pull and tension sites or staging areas where feasible or will use existing nearby airstrips and commercial airports. In each temporary landing zone or staging area, there will be a designated area for helicopter takeoff and landing.

The helicopter type will depend on availability at the time of construction; however, it is likely to be a light-duty helicopter (Hughes MD 500 or equivalent) with a load capacity of approximately 1,20 pounds, a medium-duty helicopter (Bell 407 LongRanger, Sikorsky UH-60 Black Hawk, or equivalent) with a load capacity of approximately 6,000 to 9,000 pounds are expected to be used. If helicopter use within 500 feet of residences is necessary, helicopter operations will be limited to daylight hours. The helicopter flight path generally will follow the proposed alignment and will avoid flying directly over residences. To assist with conductor stringing, a helicopter will fly a lightweight sock line and thread through traveler pulleys affixed to structure arms. This typically requires approximately 10 to 15 minutes of hover time at each structure; the remaining daily flight time will be between the structure sites and pulling and tensioning areas.

Light-duty helicopters typically result in noise of 71 to 81 dBA at 250 feet from the helicopter, which drops to 65 to 75 dBA at 500 feet (Helicopter Association 2016). Most helicopter activity is expected to occur at landing zones. Potential helicopter landing zones are shown on Figure 3.5-1, or helicopters will use existing nearby airstrips and commercial airports. Helicopter use is planned only for construction activities in the in the eastern section of the project in the open space areas of Contra Costa County.

Table 5.13-5 presents the maximum sound levels at various distances for helicopter use.

Table 5.13-5. Maximum Helicopter Noise Levels

Equipment Description	Activity	L_{max} at 100 feet (dBA)	L_{max} at 250 feet (dBA)	L_{max} at 500 feet (dBA)	L_{max} at 1000 feet (dBA)	L_{max} at 2,000 feet (dBA)
Light Helicopter	Takeoff	88	80	74	68	62
	Landing	91	83	77	71	65
	Level Flight	87	79	73	67	61
	Hover	85	77	71	65	59
Medium Helicopter	Takeoff	87	79	73	67	61
	Landing	92	84	78	72	66
	Level Flight	87	79	73	67	61
	Hover	85	77	71	65	59

Source: Transportation Noise Reference Book (Nelson 1987)

Multiple factors make it impractical to numerically predict which residences within the study area might experience annoyance caused by the proposed helicopter construction activity, including:

- Variability in how individuals react to the noise
- Variation in the noise levels that individuals might experience given changes in distance from various helicopter activities and orientation of the individual relative to the helicopter (left side versus right side)
- The presence of "blade slap" (FAA 2004) that can occur when a helicopter operates under high load or ascends or descends at a steep angle
- Varying levels of public outreach and notification on when and why helicopter noise will occur in a neighborhood (FAA 2004)

Regardless of the complexity of these factors, this assessment concludes that a limited number of residences could experience temporary, but potentially substantial, annoyance caused by intermittent helicopter activity.

Battery-operated drones may be used in some areas. Drones are expected to be used in the central and western sections to remove the portion of the existing overhead line where it will not be replaced overhead as well as stringing the new SW and OPGW lines in the rebuilt overhead alignment. Noise from drones is anticipated to be no louder than approximately 60 dBA at 50 feet which is less than light-duty helicopters as presented in Table 5.13-5.

Blasting

Blasting is not anticipated.

Corona Noise

Under certain conditions, the localized electric field near an energized conductor can be sufficiently concentrated to produce a tiny electric discharge that can ionize air close to the conductors. This partial discharge of electrical energy is called corona discharge, or corona. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops, can affect a conductor's electrical surface gradient and its corona performance. Corona is the physical manifestation of energy loss and can transform discharge energy into small amounts of sound, radio noise, heat, and chemical reactions with the air components.

During foul or wet-weather conditions (such as rain or fog), water drops collect on the conductor and increase corona activity so that a crackling or humming sound may be heard near the line. This noise is caused by small electrical discharges from the water drops. However, during heavy rain, the ambient noise generated by the falling raindrops typically will be greater than the noise generated by corona. Corona noise generally is more noticeable on high-voltage lines and usually is not a design issue for power lines rated at 345 kV and lower (CPUC 2009).

Vibration

Vibration is energy transmitted in waves through the ground. Because energy is lost during the transfer of energy from one particle to another, vibratory energy is reduced with increasing distance from the source. Human perception of vibration varies with the individual and is a function of physical setting and the type of vibration. Those exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Caltrans has developed guidance on addressing vibration issues associated with construction, operation, and maintenance of transportation projects (Caltrans 2020). Table 5.13-6 outlines the typical human response to a short-term (transient) source of vibration.

Table 5.13-6. Human Response to Transient Vibration

Human Response	Peak Particle Velocity (inches/second)
Severe	2.0
Strongly Perceptible	0.9
Distinctly Perceptible	0.24
Barely Perceptible	0.035

Source: Caltrans 2020

Caltrans Construction Vibration Guidance Manual (2020) notes, "There are no Caltrans or Federal Highway Administration standards for vibration and it is not the purpose of this manual to set standards." Rather, agencies such as Caltrans provide "… a synthesis of these criteria that can be used to evaluate the potential for damage and annoyance from vibration-generating activities." In addition, Caltrans (2020) also notes that, "in most cases, vibration induced by typical construction equipment does not result in adverse effects on people or structures. Noise from the equipment typically overshadows any meaningful ground vibration effects on people."

For most projects, the highest levels of vibration occur during construction and assessment is conducted to evaluate the potential damage to nearby buildings. The FTA manual establishes construction damage criteria in terms of peak particle velocity (PPV). These criteria are presented in Table 5.13-7 and range from a threshold of 0.12 inch per second for "buildings extremely susceptible to vibration damage" to 0.5 inch per second for "reinforced concrete, steel, or timber (no plaster)." (FTA 2018).

Although the guidance is not enforceable, it provides a basis for evaluating potential vibration from the proposed project because the construction equipment and activities associated with transportation projects are similar to those used to construct electrical transmission projects.

Table 5.13-7. Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Single Event PPV (in/sec)
1. Reinforced concrete, steel, or timber (no plaster) (buildings in steel or reinforced concrete, such as factories, retaining walls, bridges, steel towers, open channels, underground chambers, and tunnels with and without concrete alignment)	0.5	1.2
2. Engineered concrete and masonry (no plaster) (buildings with foundation walls and floors in concrete, walls in concrete or masonry, stone masonry retaining walls, underground chambers and tunnels with masonry alignments, and conduits in loose material)	0.3	0.7

Table 5.13-7. Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Single Event PPV (in/sec)
3. Nonengineered timber and masonry buildings (buildings as mentioned previously but with wooden ceilings and walls in masonry)	0.2	0.5
4. Buildings extremely susceptible to vibration damage (construction very sensitive to vibration; objects of historic interest)	0.12	0.3

Sources: Table 7-5, FTA 2018; Table 10, Caltrans 2020

These limits and building categories align with the Caltrans (2020) summary of the Swiss Association of Standardization Vibration Damage Criteria for continuous sources. The Swiss criteria provide additional details regarding the building category and provide a single event limit.

in/sec = inch(es) per second

Construction activities have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude as distance increases. Table 5.13-8 displays vibration levels for typical construction equipment.

Table 5.13-8. Typical Construction Equipment Vibration Levels

Equipment	PPV at 25 feet (in/sec)
Pile driver (impact – upper range)	1.518
Pile driver (impact – typical)	0.644
Pile driver (sonic – upper range)	0.734
Pile driver (sonic – typical)	0.170
Large Bulldozer	0.089
Caisson Drilling	0.089
Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Source: FTA 2018

Bulldozers and other construction equipment will be used regularly in the construction of the project. In addition, heavy trucks will be used to deliver and remove material to and from the site.

The risk of construction vibration damage from each piece of equipment can be assessed by adjusting the PPV from the reference PPV at 25 feet to the actual distance from the equipment to the receiver by applying the following equation:

$$PPV_{equip} = PPV_{ref} \times \left(\frac{25}{D}\right)^{1.5}$$

Where:

PPV_{equip} = the peak particle velocity of the equipment adjusted for distance, in/sec
PPV_{ref} = the source reference vibration level at 25 feet, in/sec
D = distance from the equipment to the receiver, feet

To determine the closest distance each type of building-by-building category presented in Table 5.13-7 can be to each type of equipment before sustaining damage, the equation was solved to find the distance at which the construction vibration damage criteria were met for each building category (Table 5.13-9).

Table 5.13-9. Typical Construction Equipment Vibration Levels in Peak Particle Velocity

Equipment	PPV at 25 feet (in/sec)	Building Category (Construction Vibration Damage Criteria and Distance in Feet to Criteria)			
		1 (0.5 in/sec)	2 (0.3 in/sec)	3 (0.2 in/sec)	4 (0.12 in/sec)
Pile Driver (impact – upper range)	1.518	50	75	100	135
Pile Driver (impact – typical)	0.644	30	40	55	75
Pile Driver (sonic – upper range)	0.734	30	45	60	85
Pile driver (sonic – typical)	0.170	<25	<25	<25	30
Large Bulldozer	0.089	<25	<25	<25	<25
Caisson Drilling	0.089	<25	<25	<25	<25
Trucks	0.076	<25	<25	<25	<25
Jackhammer	0.035	<25	<25	<25	<25
Small Bulldozer	0.003	<25	<25	<25	<25

The distances determined indicate that, for all building categories, general construction equipment must be less than 25 feet from the building to cause damage.

The distances determined indicate that, for all building categories, general construction equipment must be less than 25 feet from the building to cause damage. Impact pile driving in the upper range has the greatest potential to cause damage to buildings; 135 feet is the closest that pile driving can occur to a Category 4 building. Category 4 buildings are "…extremely susceptible to vibration damage…" (FTA 2018), with construction very sensitive to vibration and may be objects or buildings of historic interest.

5.13.1.2 Environmental Setting

The project will be in the City of Orinda, unincorporated areas of western Contra Costa County, the City of Piedmont, and the City of Oakland (refer to Figure 5.11-2). Land uses surrounding the project are described in Section 5.11.1.3 (Local Land Use Setting [Existing Land Use]) and are summarized in the following subsections to include the presence of noise sensitive receptors within 1,000 feet of the project boundary.

The project starts in the City of Orinda at Moraga Substation, which is located approximately 2.5 miles southeast of SR 24. The lines progress generally southwest and cross through hilly open space and park land in unincorporated Contra Costa County, through an area mainly owned by EBRPD and East Bay Municipal Utility District, to the top of the Oakland Hills; this section is referred to as the eastern section. At this point, the lines enter the City of Oakland within Alameda County, where the land use changes to an area of predominantly residential use with some recreational areas. The lines continue southwest down the western side of the Oakland Hills, crossing Skyline Boulevard and paralleling the general alignment of Shepherd Canyon Road to SR 13; this section is referred to as the central section. From SR 13, the lines parallel the general alignments of Sausal Creek within Dimond Canyon Park and Park Boulevard to Oakland X Substation; this section is referred to as the western section. Oakland X Substation is located approximately 0.10 mile east of Interstate 580 (I-580) near its intersection with Park Boulevard. The existing ROW between Park Boulevard and Oakland X Substation has direct encroachment under the lines by residential structures built after the lines were in service and includes approximately 0.25 mile of ROW within the City of Piedmont.

Major land uses within 1,000 feet of the project boundary are summarized as follows:

- City of Orinda: Gateway Valley Planning Area (56 percent); residential (22 percent); and utilities (22 percent) (Orinda 2005)
- Contra Costa County: parks and recreation (83 percent); agricultural lands (7 percent); watershed (7 percent); and public and semi-public (3 percent) (Contra Costa County 2021)
- City of Oakland: residential (82 percent); resource conservation, parks, and open space (13 percent); institutional, including schools (4 percent); and neighborhood mixed use (1 percent) (Oakland 2023a)
- City of Piedmont: residential (97 percent) and schools/churches (3 percent) (note that 100 percent of area is designated residential land use in the General Plan) (Piedmont 2020)

Within the City of Orinda, land use along the power lines is designated as utility at and near Moraga Substation and Gateway Valley Planning Area along the alignment within the city boundaries (Orinda 1987). The Gateway Valley Planning Area subsequently designated the area as open space (Orinda Gateway L.L.C. 2005). Existing land uses that intersect the project footprint consist of utility (Moraga Substation and power lines) and open space with recreation trails and dirt access roads.

Within Contra Costa County, land use along the power lines is designated as watershed and parks and recreation (Contra Costa County 2005). Existing land uses that intersect the project footprint consist of open space with recreational trails, parking areas, and dirt and paved roads.

Within the City of Oakland, land use along the power lines is designated as mixed housing type residential, neighborhood center mixed use, hillside residential, institutional, resource conservation, and urban park and open space (Oakland 2023a). Existing land uses that intersect the project footprint consist of residential (primarily single-family with a small number of multi-family units); parks and open space, including Shepherd Canyon Park, Dimond Park, and a golf facility; utilities, including PG&E Oakland X Substation; churches and schools; and a small amount of commercial land.

Within the City of Piedmont, land use along the power lines is designated as low-density residential (Piedmont 2020). Existing land uses that intersect the project footprint consist of single-family residential, a church, and an associated school.

5.13.1.3 Sensitive Receptors

Noise sensitive receptors generally are defined as locations where people reside or where the presence of unwanted sound may adversely affect the existing land use. Typically, noise-sensitive land uses include residences, hospitals, places of worship, libraries, performance spaces, offices, and schools, as well as nature and wildlife preserves, recreational areas, and parks. Sensitive receptors within 1,000 feet of the project boundary were identified using publicly available mapping tools. Most of the project is in relatively dense urban residential areas. Therefore, nearly all the identified sensitive receptors are residences.

Residential areas containing noise sensitive receptors within 1,000 feet of the project are shown on Figure 5.3-1. Table 5.3-3 in Section 5.3, Air Quality, lists 6 daycare facilities, 10 schools, 2 elderly housing facilities, and 10 parks and open spaces within 1,000 feet of the project. No hospitals or libraries are within 1,000 feet of the project. Office buildings were not identified in these residential areas. Most of the construction equipment will be used at the work areas shown on Figure 3.5-1; construction activities along much of the alignment generally will be limited to stringing the replacement conductors.

Sensitive receptors are described in the following sections by construction work stream and section of the alignment.

Modify Moraga Substation

Moraga Substation is located within the City of Orinda on Lost Valley Drive. There are approximately 115 sensitive receptors located within 1,000 feet of Moraga Substation. The closest receptors to the substation work area are approximately 575 feet to the southeast of the substation. A staging area is located adjacent to the substation work area. The closest receptors to the staging area are approximately 100 feet to the south.

Rebuild Overhead Lines – Eastern Section

The eastern section refers to the project between Moraga Substation and the top of the Oakland Hills. There are approximately 71 residences within 1,000 feet of the eastern section of the 115 kV power lines and associated work areas. The sensitive receptors closest to work areas are near Moraga Substation. Sensitive receptors are approximately 520 feet from the tension pull site adjacent to Moraga Substation. Six potential landing zones are identified in the eastern section of the project. Five of the potential landing zones are more than 2,000 feet from the closest residence in the City of Orinda, in the City of Oakland or in the community of Canyon. In addition, a helicopter landing zone is colocated with a staging area to the northwest of Moraga Substation near the community of Wilder in the City of Orinda. The closest receptor to this staging area is approximately 225 feet. The alignment in the eastern section also passes through Sibley Volcanic Regional Preserve and Huckleberry Regional Botanic Preserve and users of recreational trails in the preserves may be within 1,000 feet of the project. However, trail users are transient and can choose to avoid trails when construction is nearby.

Rebuild Overhead Lines – Central Section

The central section of the project is between the top of the Oakland Hills and SR 13. There are approximately 1,362 sensitive receptors within 1,000 feet of the central section of the 115 kV power lines east of SR 13. Of these, 129 sensitive receptors fall within 100 feet of the lines to be rebuilt or near the corresponding work areas, and 30 sensitive receptors are within 50 feet. In addition, a staging area is located south of the power lines along Monterey Boulevard at Lincoln Avenue. There are approximately 239 sensitive receptors within 1,000 feet of the staging area.

Rebuild Western Portion Underground – Western Section

The western section of the project, most of which will be constructed as part of the rebuild western portion underground work stream, is between SR 13 and Oakland X Substation. In the western section of the project, the lines transition from overhead lines to underground lines at four transition structures. The rebuilt Circuits 1 and 2 on the northern line will transition to underground northwest of the intersection of Estates Drive and Park Boulevard and then follow Park Boulevard. The rebuilt Circuits 3 and 4 on the southern line also will transition to underground from transition structures along Park Boulevard south of its intersection with Estates Drive. The existing overhead structures and lines will be removed from the transition point at the northwest corner of Park Boulevard and Estates Drive to Oakland X Substation. There are approximately 2,980 sensitive receptors within 1,000 feet of the western section of the project alignment west of SR 13. Of these, 380 sensitive receptors fall within 100 feet of the lines to be rebuilt or corresponding work areas, and 119 sensitive receptors are within 50 feet.

Modify Oakland X Substation

Oakland X Substation is located within the City of Oakland on Park Boulevard near I-580. There are approximately 445 sensitive receptors located within 1,000 feet of Oakland X Substation. Sensitive receptors surround the substation, with the closest receptor located approximately 30 feet to the north.

Airports

The project is located more than 2 miles away from the nearest public or private airport.

5.13.1.4 Noise Setting

Existing ambient sound levels may vary both temporally and spatially for several reasons. That is, there is no single answer for what the existing sound level is—ambient sound levels vary. For example, wind may result in rustling vegetation noise on one day, whereas calm conditions on another day will result in different sound levels, even at the same location. Changes in traffic patterns, periodic landscaping and maintenance activities, and building construction in an urban environment can result in different levels of sound.

Annex C of the American National Standards Institute (ANSI) Standard S12.9, *Quantities and Procedures for Description and Measurement of Environmental Sound—Part 3: Short-term Measurements with an Observer Present* (Annex C ANSI Standard S12.9) (ANSI 2023), provides estimated day and night sound levels based on land use category. The ANSI standard estimation divides land uses into six distinct categories. Descriptions of these land use categories, along with the typical day and nighttime levels, are provided in Table 5.13-10. Of the six categories, the residential areas in the vicinity of the project area range between Categories 2 and 5. For these categories, sound levels are expected to range between 39 dBA at night to 61 dBA during the day. At times, one could reasonably expect both daytime and nighttime periods to be louder or quieter than the levels stated and ANSI notes the "95 percent prediction interval [confidence interval] is on the order of +/- 10 dB."

Table 5.13-10. A-weighted Sound Levels Corresponding to Land Use and Population Density

Category	Land Use	Description	People per Square Mile	Day (L_{eq}, dBA)	Night (L_{eq}, dBA)
1.	Noisy Commercial and Industrial Areas and Very Noisy Residential Areas	Very heavy traffic conditions, such as in busy "downtown" commercial areas; at intersections for mass transportation or for other vehicles, including elevated trains, heavy motor trucks, and other heavy traffic; and at street corners where many motor buses and heavy trucks accelerate.	63,840	66	58
2.	Moderate Commercial and Industrial Areas and Noisy Residential Areas	Heavy traffic areas with conditions similar to Category 1 but with somewhat less traffic; routes of relatively heavy or fast automobile traffic, but where heavy truck traffic is not extremely dense.	20,000	61	54
3.	Quiet Commercial, Industrial Areas, and Normal Urban and Noisy Suburban Residential Areas	Light traffic conditions where no mass transportation vehicles and relatively few automobiles and trucks pass, and where these vehicles generally travel at moderate speeds. Residential areas and commercial streets and intersections with little traffic comprise this category.	6,384	55	49
4.	Quiet Urban and Normal Suburban Residential Areas	These areas are similar to Category 3, but for this group the background is either distant traffic or is unidentifiable. Typically, the population density is one-third the density of Category 3.	2,000	50	44
5.	Quiet Residential Areas	These areas are isolated, far from significant sources of sound, and may be situated in shielded areas such as a small, wooded valley.	638	45	39
6.	Very Quiet, Sparse Suburban, or Rural Residential Areas	These areas are similar to Category 4, but are usually in sparse suburban or rural areas, and for this group there are few if any near sources of sound.	200	40	34

Source: ANSI 2023

Most of the sensitive receptors along the project alignment are in the City of Oakland. The City of Oakland performed a citywide noise monitoring survey in 2004 (Oakland 2004). Three long-term and four short-term monitoring locations from the study were located within approximately 1 mile of the project alignment (Exhibit 5.13-1).

Measurements conducted at the long-term and short-term measurement locations are presented in Tables 5.13-11 and 5.13-12, respectively. Noise levels in the project area, as measured in this study, ranged from a nighttime low L_{eq} of 32 dBA near Skyline Boulevard to a high of 73 dBA near I-580. The variation in sound levels corresponds to with population densities and proximity to major transportation corridors. For example, the lowest sound levels were measured at LT-2, a location in a less densely populated area, further from major roads. Short-term, daytime, measurements had a range in L_{eq} from 59 to 67 dBA. The range in daytime sound levels measured in the study generally is consistent with the range of ANSI standard levels presented in Table 5.13-10 for Categories 1 to 3, while the nighttime sound levels were more closely aligned with Category 1.

Exhibit 5.13-1. City of Oakland Long-Term (LT) and Short-Term (ST) Noise Monitoring Locations

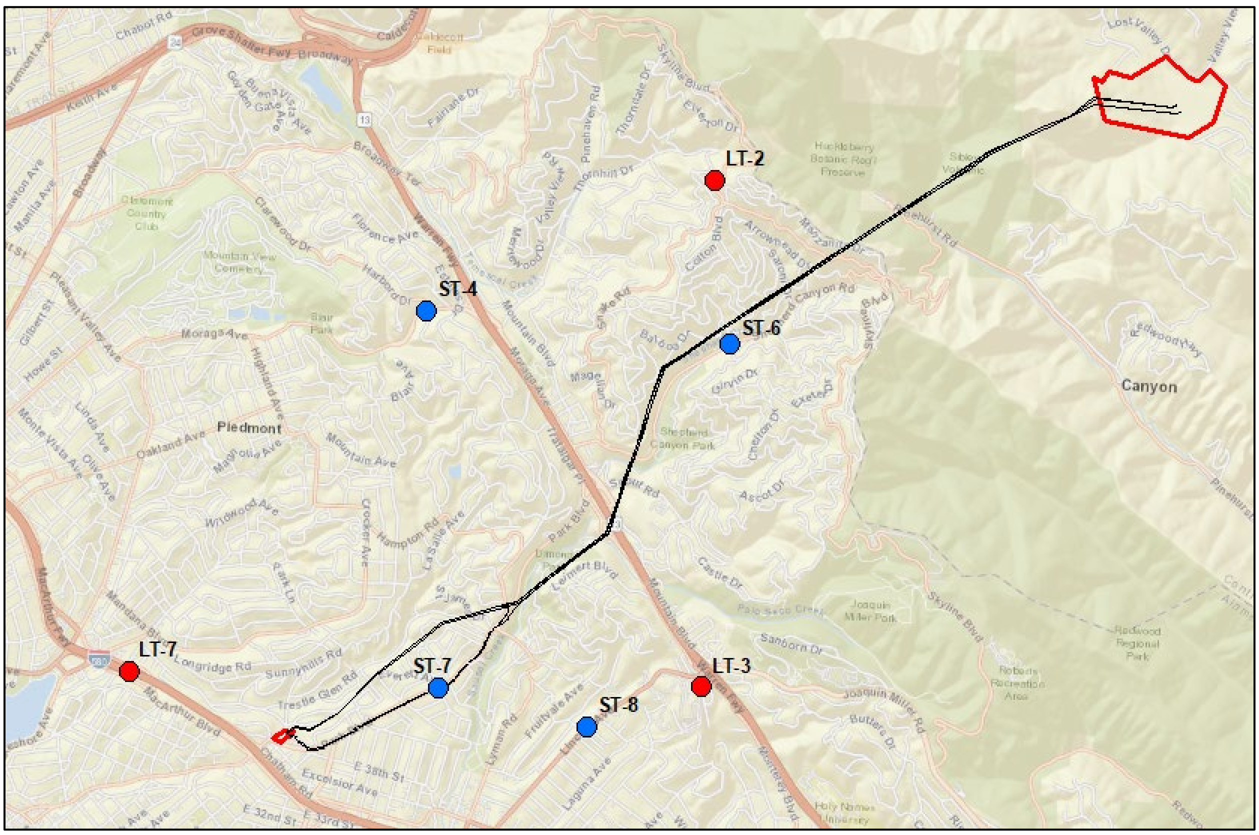


Table 5.13-11. Summary of Long-Term (LT) Noise Measurements

Site	Location (Distance, in feet, from Centerline of Road)	Date	Noise Levels (dBA)		L_{dn}
			Daytime (L_{eq})	Nighttime (L_{eq})	
LT-2	Skyline Boulevard (approximately 20 ft), at 7293 Skyline Boulevard	8/17 to 8/19/2004	55 to 68	32 to 58	61 to 63
LT-3	SR 13 (approximately 90 ft), at Monterey Boulevard and Maiden Lane	8/17 to 8/19/2004	67 to 72	57 to 69	72
LT-7	I-580 (approximately 186 ft), at Wesley Street	8/17/2004	72 to 73	--	--

Source: City of Oakland 2004

Table 5.13-12. Summary of Short-Term (ST) Noise Measurements

Site	Location (Distance, in feet, from Centerline of Road)	Date; Time	L_{max}	L_{min}	L_1	L_{10}	L_{50}	L_{90}	L_{eq}
ST-4	Moraga Avenue (approximately 54 ft), at Harbor Drive	8/18/2004; 12:15 a.m.	74	45	72	70	63	55	65
ST-6	Shepard Canyon Road (approximately 63 ft), at Paso Robles Drive	8/18/2004; 2:00 a.m.	77	41	70	63	52	44	59
ST-7	Park Boulevard (approximately 63 ft), at Everett Avenue	8/23/2004; 2:00 a.m.	78	46	76	71	64	53	67
ST-8	Lincoln Avenue (approximately 42 ft), at Burlington Street	8/23/2004; 2:20 a.m.	83	42	77	67	56	46	65

Source: City of Oakland 2004

5.13.2 Regulatory Setting

This section identifies federal, state, and local laws, policies, and standards for noise.

5.13.2.1 Federal

No federal regulations that limit overall environmental noise levels are applicable to the project.

5.13.2.2 State

No state regulations that limit overall environmental noise levels are applicable to the project.

5.13.2.3 Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process. Airport land use compatibility plans are discussed in Section 5.11, Land Use and Planning, and safety concerns around airports are discussed in Section 5.9, Hazards, Hazardous Materials and Public Safety.

The proposed project will be located within the City of Orinda, unincorporated areas of Contra Costa County, and the cities of Oakland and Piedmont within Alameda County. This section considers policies and regulations of these jurisdictions as they relate to noise in the project area.

Summary of Local Noise Regulations

A summary of the local noise regulations by the jurisdiction is presented in Table 5.13-13.

Table 5.13-13. Summary of Local Noise Regulations by Jurisdiction and Project Component

Jurisdiction (Project Component)	Local Noise Regulations Information
City of Orinda (Moraga Substation)	Construction Noise – exempt from noise limit Construction is limited to 8:00 a.m. to 6:00 p.m. Monday through Friday and 10:00 a.m. to 5:00 p.m. on Saturday. No construction is to be conducted on Sundays or major holidays. No heavy construction equipment is to be used Saturdays or Sundays.
Unincorporated Contra Costa County (eastern section of project alignment)	No established noise ordinance.
City of Oakland (central section and most of western section of project alignment, and Oakland X Substation)	Construction Noise – noise limits are established for short-term (less than 10 days) and long-term (more than 10 days) construction duration. Daytime Construction Noise ▪ 80 dBA (short term) and 65 dBA (long term) at residential receiving property from 7:00 a.m. to 7:00 p.m. Monday through Friday ▪ 65 dBA (short term) and 55 dBA (long term) at residential receiving property from 9:00 a.m. to 8:00 p.m. Saturday and Sunday ▪ 85 dBA (short term) and 70 dBA (long term) at commercial or industrial receiving property from 7:00 a.m. to 7:00 p.m. Monday through Friday ▪ 70 dBA (short term) and 60 dBA (long term) at commercial or industrial receiving property from 9:00 a.m. to 8:00 p.m. Saturday and Sunday Nighttime Construction Noise ▪ Nighttime noise limit for construction between 7:00 p.m. and 7:00 a.m. Monday through Friday or between 8:00 p.m. and 9:00 a.m. on Saturdays and Sundays and federal holiday shall not exceed the applicable nighttime noise level standards as described for operational noise above.
City of Piedmont (portion of western section of alignment)	No established limits on daytime construction noise. No construction may be conducted between 6:00 p.m. and 8:00 a.m. Monday through Friday, or from 6:00 p.m. to 9:00 a.m. Saturday through Sunday.

City of Orinda

Noise-controlling criteria are presented in the City's General Plan and Municipal Code as detailed in the following subsections.

City of Orinda General Plan

The *City of Orinda General Plan* 1987 – 2007 (Orinda 1987) includes a Noise Element containing setting information, a brief discussion of issues, and guiding and implementing policies. Traffic is the primary source of continuous noise in the city and noise contour maps are included in the Noise Element.

The City of Orinda Noise Element guiding policies and implementing policies include the following:

- Guiding Policies
  - B. Prevent unnecessary noise from all sources.
- Implementing Policies
  - C. Develop ordinance to limit noise created by temporary activities such as building construction to the shortest duration possible, and to daytime hours wherever possible. All reasonable noise mitigation measures would be used.
  - F. Adopt a comprehensive noise ordinance.

Orinda Municipal Code

The City of Orinda regulates noise by Chapter 17.39 of the Orinda Municipal Code (City of Orinda 2022). Orinda has established a limit of 60 dBA not to be exceeded on any other property from the source of the noise. Construction is specifically exempted from this limit by Section 17.39.A.

Construction is addressed in Section 17.39.3:

- A. Intent. The purpose of this section is to regulate hours of construction in order to balance the desire of Orinda residents for a reasonably quiet home environment with the desire of their neighbors, also Orinda residents, to improve their properties efficiently and economically. The City Council recognizes the cost to individual homeowners of requiring rented equipment to lie idle and the fact that unanticipated weather conditions may affect home construction project timing. On the other hand, the City Council expects that residents will carefully plan home construction projects to avoid typical adverse weather conditions, to finish as quickly as possible and to impact fellow neighbors as little as possible. Although exceptions to the limitations of this section may be granted, the council intends that such exceptions be granted only when the Zoning Administrator determines them to be reasonable and necessary, balancing the rights of all interested persons.
- B. General. It is unlawful to conduct or maintain construction activities in the City of Orinda during times other than those set forth in this subsection.
  - 1. Weekdays. Monday through Friday, construction activities may occur between the hours of eight a.m. and six p.m.
  - 2. Saturdays. On Saturdays, construction activities may occur between the hours of ten a.m. and five p.m.
  - 3. Sundays. On Sundays, construction activities are prohibited except for minor maintenance and improvement projects conducted by no more than two persons, one of whom resides on the property full-time, between the hours of ten a.m. and five p.m. and not involving the use of heavy construction equipment.
  - 4. Holidays. On the following holidays, construction activities are prohibited: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. This rule supersedes the restrictions in subsections (B)(1), (B)(2) and (B)(3) of this section. No exceptions from this holiday prohibition may be granted.

Contra Costa County General Plan

The following paragraph summarizes the guidelines established in Contra Costa County's General Plan for operational and temporary construction activities.

The project traverses a generally uninhabited area of unincorporated Contra Costa County.[27] The Noise Element of the *Contra Costa County General Plan* 2005 – 2020 provides goals, policies, and implementation programs to minimize exposure to excessive noise sources that may cause undue stress or annoyance. The Noise Element includes an analysis of major noise sources in the County and noise contours along major traffic corridors (Contra Costa County 2005). The Noise Element also sets noise standards to prevent new noise conflicts by addressing the needs of noise-sensitive land uses, establishing noise-reducing project design features, and establishing appropriate noise emission standards.

[27] There are no sensitive receptors in unincorporated Contra Costa County within 1,000 feet of the project. The noise receptors adjacent to the work within unincorporated Contra Costa County are located within the city limits of Orinda and Oakland. The noise regulations for Contra Costa County, City of Orinda, and City of Oakland are summarized for completeness.

Contra Costa County Noise Element goals and policies include the following:

- Goal
  - 11-A. To improve the overall environment in the County by reducing annoying and physically harmful levels of noise for existing and future residents and for all land uses.
  - 11-B. To maintain appropriate noise conditions in all areas of the County.
  - 11-E. To recognize citizen concerns regarding excessive noise levels, and to utilize measures through which the concerns can be identified and mitigated.
- Policies
  - 11-1. New projects shall be required to meet acceptable exterior noise level standards as established in the Noise and Land Use Compatibility Guidelines contained on Figure 11-6 [reproduced as Exhibit 5.13-2 in this section]. These guidelines, along with the future noise levels shown in the future noise contours maps, should be used by the county as a guide for evaluating the compatibility of "noise sensitive" projects in potentially noisy areas.
  - 11-6. If an area is currently below the maximum "normally acceptable" noise level, an increase in noise up to the maximum should not be allowed necessarily.
  - 11-7. Public projects shall be designed and constructed to minimize long-term noise impacts on existing residents.
  - 11-8. Construction activities shall be concentrated during the hours of the day that are not noise sensitive for adjacent land uses and should be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.
  - 11-9. Sensitive land use shall be encouraged to be located away from noise areas, or the impacts of noise on these uses shall be mitigated. If residential areas are planned adjacent to industrial noise sources, then a noise study shall be performed to determine the extent of any noise impacts and recommend appropriate noise mitigation measures.
  - 11-11. Noise impacts upon the natural environment, including impacts on wildlife, shall be evaluated and considered in review of development projects.

Implementation measures required during a developmental review include the following:

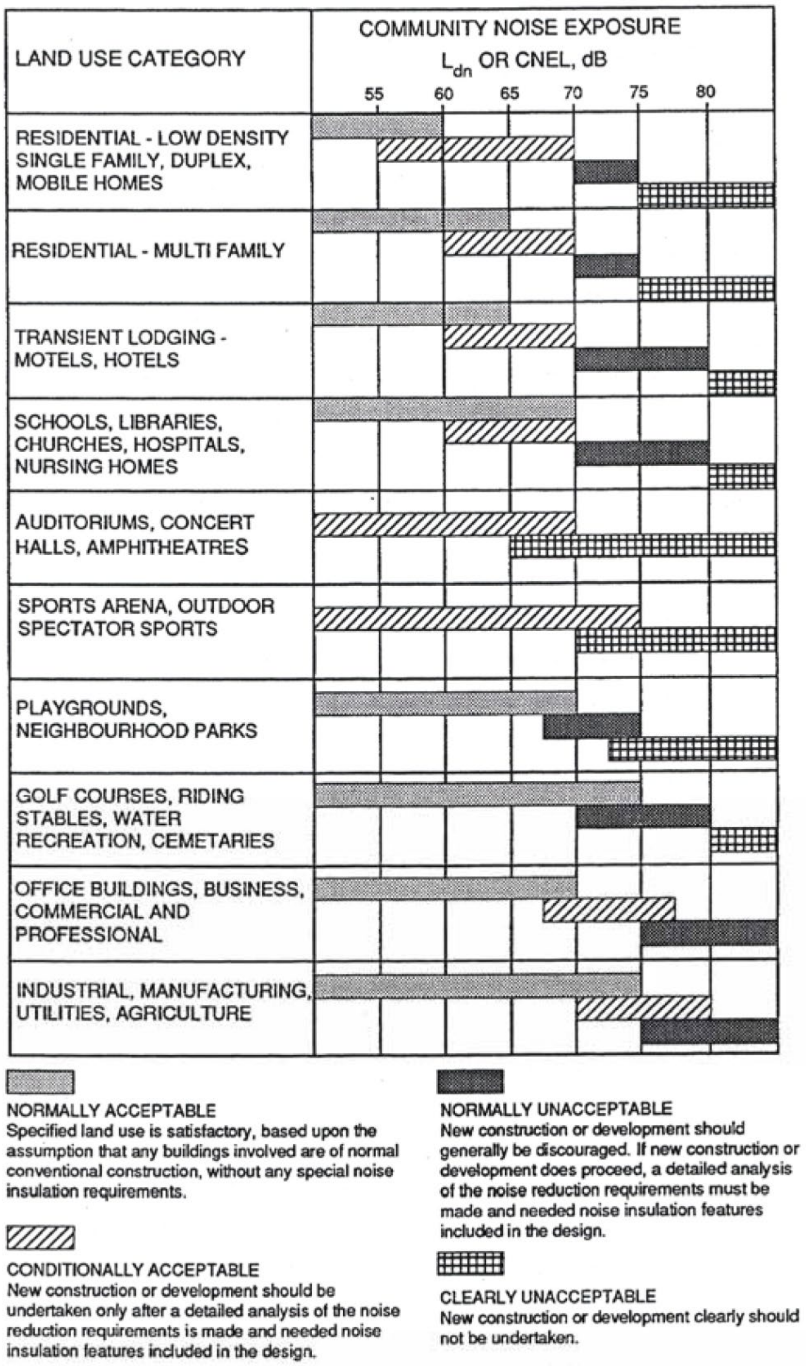
- 11-a. Continue to require a review and analysis of noise-related impacts as part of the existing project development review procedures of the County.
- 11-b. Evaluate the noise impacts of a proposed project upon existing land uses in terms of the applicable federal, state, and local codes, and the potential for adverse community response, based on a significant increase in existing noise levels.

Zoning and other ordinance amendments from the General Plan are as follows:

- 11-f. Adopt a noise ordinance as the method to regulate noise from sources other than transportation sources. The noise ordinance should include specific noise level limits for stationary sources (i.e., projects). These noise level limits should take into account the type of adjacent land use (i.e., residential, commercial, or industrial). The State of California Office of Noise Control has published a Model Community Noise Ordinance.

Contra Costa County has not established a noise ordinance in the County Code (Contra Costa County 2024).

Exhibit 5.13-2. Land Use Compatibility for Community Noise Environments



Source: Contra Costa County 2005

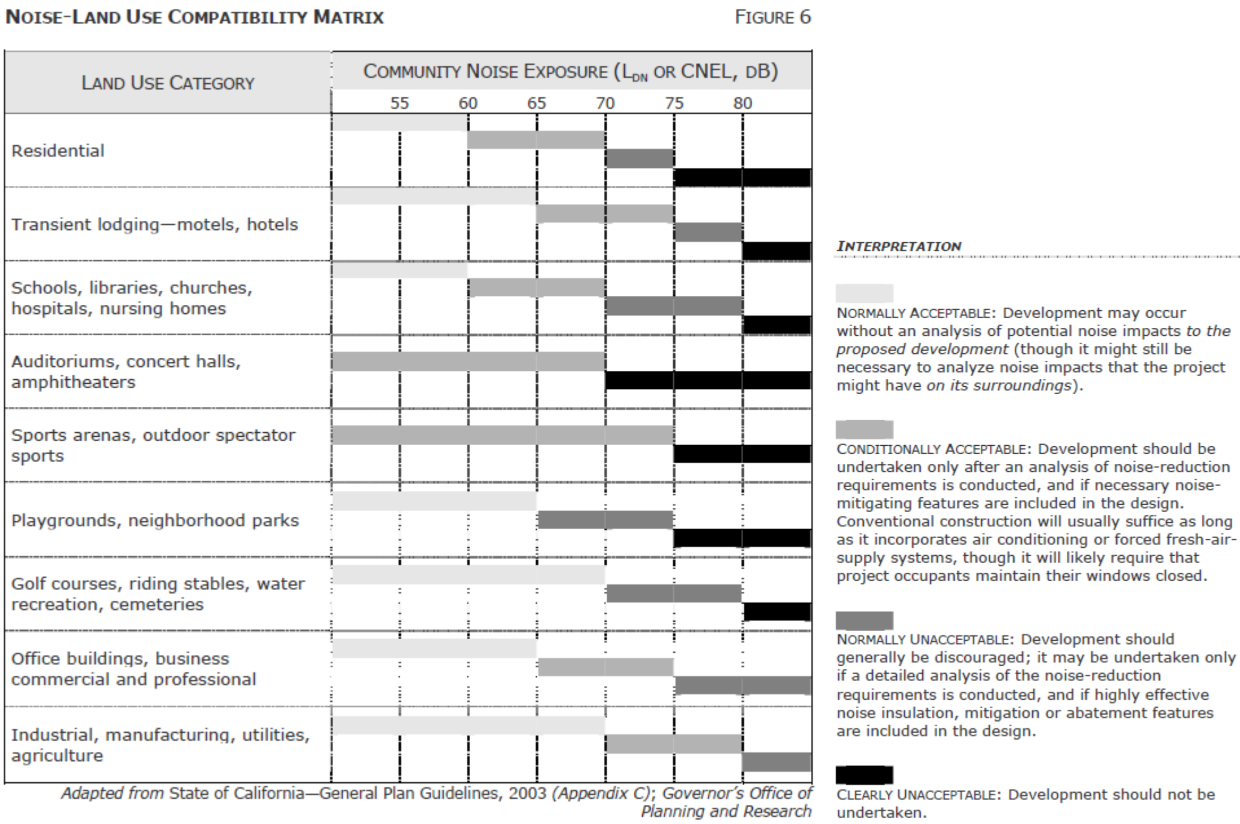
City of Oakland

Noise-controlling criteria are presented in the City's General Plan and Municipal Code as detailed in the following subsections.

City of Oakland General Plan

The *City of Oakland General Plan* (Oakland 2005) includes a Noise Element containing goals, objectives, and policy actions designed to provide direction for the city to guide development-related decision-making to protect residents' exposure to excessive noise. The major noise sources in Oakland are transportation related, including major thoroughfares, the rapid transit rail system, and international airport. A citywide noise study was performed in 2004 and noise contours are presented in the General Plan. The noise contour maps provide a basis for establishing acceptability of proposed land uses by location. The General Plan includes the noise-land use compatibility matrix by noise exposure level presented in Exhibit 5.13-3.

Exhibit 5.13-3. Noise-Land Use Compatibility Matrix



Source: City of Oakland 2005

Goals and policy statements established in the General Plan regarding noise are as follows:

- Goals
  - To protect Oakland's quality of life and the physical and mental well-being of residents and others in the City by reducing the community's exposure to noise; and
  - To safeguard Oakland's economic welfare by mitigating noise incompatibilities among commercial, industrial, and residential land uses.
- Policy 1 – Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses but also with their surrounding noise environment.
  - Action 1.1: Use the noise-land use compatibility matrix (Figure 6 [reproduced as PEA Exhibit 5.13-3]) in conjunction with the noise contour maps (especially for roadway traffic) to evaluate the acceptability of residential and other proposed land uses and also the need for any mitigation or abatement measures to achieve the desired degree of acceptability.
  - Action 1.2: Continue using the City's zoning regulations and permit processes to limit the hours of operation of noise-producing activities which create conflicts with residential uses and to attach noise-abatement requirements to such activities.

- Policy 2 – Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.
  - Action 2.1: Review the various noise prohibitions and restrictions under the City's nuisance noise ordinance and revise the ordinance if necessary.
  - Action 2.2: As resources permit, increase enforcement of noise-related complaints and also of vehicle speed limits and of operational noise from cars, trucks and motorcycles.
- Policy 3 – Reduce the community's exposure to noise by minimizing the noise levels that are *received* by Oakland residents and others in the City. (This policy addresses the reception of noise whereas Policy 2 addresses the generation of noise.)
  - Action 3.2: Review the City's noise performance standards and revise them as appropriate to be consistent with City Council policy.

Some noise-related policies are also included in other elements of the General Plan. The following policy statements are from the Land Use and Transportation Element:

- Policy T1.6: Designating truck routes. An adequate system of roads connecting port terminals, warehouses, freeways and regional arterials, and other important truck destinations should be designated. This system should rely upon arterial streets away from residential neighborhoods.
- Policy T1.8: Re-routing and enforcing truck routes. The City should make efforts to re-route traffic away from neighborhoods, wherever possible, and enforce truck route controls.

Oakland Municipal Code

Chapter 17 of the Oakland Municipal Code contains noise performance standards and a nuisance noise ordinance. The noise performance standards establish maximum noise levels across real property lines at residential, commercial, manufacturing, and other specified land uses. Maximum noise levels for both short- and long-term construction and demolition activities are also established in the Code. The nuisance noise ordinance generally prohibits "excessive or annoying" noise.

Section 17.120.050 of the Oakland Municipal Code states the following.

- All activities shall be so operated that the noise level inherently and regularly generated by these activities across real property lines shall not exceed the applicable values indicated in Subsection A., B., or C. as modified where applicable by the adjustments indicated in Subsection D. or E. Further noise restrictions are outlined in Section 8.18.010 of the Oakland Municipal Code.
  - A. Residential Zone Noise Level Standards. The maximum allowable noise levels received by any Residential Zone are described in Table 17.120.01 [reproduced as Table 5.13-14].

Table 5.13-14. Maximum Allowable Receiving Noise Level Standards, Residential and Civic

Cumulative Number of Minutes in Either the Daytime or Nighttime One Hour Time Period	Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
20	60	45
10	65	50
5	70	55
1	75	60
0	80	65

Source: City of Oakland 2024

  - B. Commercial Noise Level Standards. The maximum allowable noise levels received by any land use activity within any Commercial Zone (including the Housing and Business Mix HBX Zones, and the Central Estuary District D-CE-3 and D-CE-4 Zones) are described in Table 17.120.02 [reproduced as Table 5.13-15].

Table 5.13-15. Maximum Allowable Receiving Noise Level Standards, Commercial

Cumulative Number of Minutes in Either the Daytime or Nighttime One Hour Time Period	Anytime
20	65
10	70
5	75
1	80
0	85

Source: City of Oakland 2024

- C. Industrial, Agricultural and Extractive Noise Level Standards. The maximum allowable noise levels received by any land use activity within any Industrial Zone are described in Table 17.120.03 [reproduced as Table 5.13-16].

Table 5.13-16. Maximum Allowable Receiving Noise Level Standards, Industrial, Agricultural, and Extractive

Cumulative Number of Minutes in Either the Daytime or Nighttime One Hour Time Period	Anytime
20	70
10	75
5	80
1	85
0	90

Source: City of Oakland 2024

- D. In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the stated applicable noise level shall be adjusted so as to equal the ambient noise level.

- E. Each of the noise level standards specified in Subsections A., B., and C. shall be reduced by five (5) dBA for a simple tone noise such as a whine, screech, or hum, noise consisting primarily of speech or music, or for recurring impulse noise such as hammering or riveting.

- G. Temporary Construction or Demolition Which Exceed the Following Noise Level Standards.

  - 1. The daytime noise level received by any Residential, Commercial, or Industrial land use which is produced by any nonscheduled, intermittent, short-term construction or demolition operation (less than ten (10) days) or by any repetitively scheduled and relatively long-term construction or demolition operation (ten (10) days or more) shall not exceed the maximum allowable receiving noise levels described in Table 17.120.04 [reproduced as Table 5.13-17].

    - 2. The nighttime noise level received by any land use and produced by any construction or demolition activity between weekday hours of seven (7) p.m. and seven (7) a.m. or between eight (8) p.m. and nine (9) a.m. on weekends and federal holidays shall not exceed the applicable nighttime noise level standards outlined in this Section.

Table 5.13-17. Maximum Allowable Receiving Noise Level Standards, dBA

Land Use	Daily 7:00 a.m. to 7:00 p.m.	Weekends 9:00 a.m. to 8:00 p.m.
Short-Term Operation of Construction Equipment (less than 10 days)		
Residential	80	65
Commercial, Industrial	85	70
Long-Term Operation of Construction Equipment (10 days or more)		
Residential	65	55
Commercial, Industrial	70	60

Source: City of Oakland 2024

Excessive and annoying noises are prohibited in Section 8.18 of the City of Oakland Municipal Code. An "annoying noise" is defined as a noise with a repetitive pattern, shrill frequencies, and/or static-like sounds, including loud music. Noise from leaf blowers, alarms, engines, barking dogs, and other animals is included in the definition of "annoying noises." "Excessive noise" is defined as any unnecessary noise which persists for ten minutes or more. Section 8.18.010 includes the following prohibitions on excessive and annoying noises.

- A. It is unlawful for any person to create or allow to be created any excessive or annoying noise as defined herein. Any violation of the regulations specified herein shall be punishable as an infraction.
- C. Excessive and Annoying Noises a Nuisance. The following acts, and the causing or permitting thereof, shall be considered disturbing the peace and shall constitute an infraction.
  - 1. Mechanical or Electronic Devices. Using any mechanical or electronic device for the intensification of any sound or noise into the public streets which produces excessive or annoying noise;
  - 6. Stationary Nonemergency Signaling Devices. Sounding of any electronically amplified signal from any stationary bell, chime, siren, whistle, or similar device, intended primarily for nonemergency purposes, from any place, for more than ten seconds in an hourly period. Churches, schools, and bell towers shall be exempt from the operation of this provision;
  - 8. Loading and Unloading. Loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, refuse, or similar objects between the hours of nine p.m. and six a.m. in such a manner as to cause a noise disturbance across a residential property line or at any time to violate the applicable noise provisions of the Oakland Planning Code;
  - 9. Domestic Power Tools, Machinery. Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, or similar tool between nine p.m. and six a.m. so as to create a noise disturbance across a real property line or at any time to violate the applicable noise provisions of the Oakland Planning Code;
  - 10. Sensitive Uses. Creation of any noise within or adjacent to a hospital or medical care facility, nursing home, school, court, day care, church, or similar facility, so as to interfere with the functions of such activity;
  - 11. Noise resulting from construction and demolition activities, the operation of commercial refrigeration units, air conditioning systems, compressors, commercial exhaust systems, ventilation units, and other commercial or industrial noises associated with land use activities, shall be regulated pursuant to standards contained within the noise regulations of the Oakland Planning Code.

Section 8.18.020 includes the following statements on persistent noises that are a nuisance.

- The persistent maintenance or emission of any noise or sound produced by human, animal, or mechanical means, between the hours of nine p.m. and seven a.m. next ensuing, which, by reason of its raucous or nerve-racking nature, shall disturb the peace or comfort, or be injurious to the health of any person shall constitute a nuisance.

- Failure to comply with the following provisions shall constitute a nuisance.
  - A. All construction equipment powered by internal combustion engines shall be properly muffled and maintained.
  - B. Unnecessary idling of internal combustion engines is prohibited.
  - C. All stationery noise-generating construction equipment such as tree grinders and air compressors are to be located as far as is practical from existing residences.
  - D. Quiet construction equipment, particularly air compressors, are to be selected whenever possible.
  - E. Use of pile drivers and jack hammers shall be prohibited on Sundays and holidays, except for emergencies and as approved in advance by the Building Official.
- Whenever the existence of any such nuisance shall come to the attention of the Health Officer, it shall be his or her duty to notify in writing the occupant of the premises upon which such nuisance exists, specifying the measures necessary to abate such nuisance, and unless the same is abated within forty-eight (48) hours thereafter, the occupant so notified shall be guilty of an infraction, and the Health Officer shall summarily abate such nuisance.

Vibration is addressed in Section 17.120.060 of the City of Oakland Municipal Code:

- All activities, except those located within the M-40 Zone, the D-CE-1, D-CE-2, D-CE-5, or D-CE-6 Zones, or in the D-CO, IG, M-30, or CIX Zones more than four hundred (400) feet from any Residential Zone boundary, shall be so operated as not to create a vibration which is perceptible without instruments by the average person at or beyond any lot line of the lot containing such activities. Ground vibration caused by motor vehicles, trains, and temporary construction or demolition work is exempted from this standard.

City of Piedmont

Noise-controlling criteria are presented in the City's General Plan and Municipal Code as detailed in the following subsections.

City of Piedmont General Plan

The *City of Piedmont General Plan* (Piedmont 2020) includes an Environmental Hazards Element that addresses noise. The City of Piedmont is described as a relatively quiet residential city. As such, domestic noise sources are a greater concern. Noise sources are regulated by the Piedmont Municipal Code and the Building Code. The Environmental Hazards Element includes short-term and long-term noise measurements conducted in 2007. The resulting ambient noise levels range from 65 dBA near major thoroughfares to generally below 60 dBA and in most cases below 50 dBA. As noted in the General Plan, the hilly terrain and wooded character of the city provide additional noise shielding.

Noise compatibility standards for different land uses are presented in Table 5.13-18.

Table 5.13-18. Recommended Maximum Allowable Receiving Noise Level Standards, dBA (L_{dn})

Land Use	Interior	Exterior		
		Normally Acceptable	Conditionally Acceptable	Normally Unacceptable
Low-density Residential	45	<60	60-70	>70
Medium-density Residential	45	<65	65-70	>70
Office	55	<65	65-75	>75
Retail	60	<65	65-75	>75

Table 5.13-18. Recommended Maximum Allowable Receiving Noise Level Standards, dBA (L_{dn})

Schools/Churches	45	<60	60-70	>70
Parks and Playgrounds	--	<67	67-75	>75

Source: City of Piedmont 2020

Goals, policies, and actions contained in the Environmental Hazards Element of the General Plan include the following:

Goal 22: Noise

- Maintain the peace and quiet of Piedmont neighborhoods.

Policies and Actions

- Policy 22.6: Non-Piedmont Noise Sources: Seek to reduce noise emanating from outside the city limits when it detrimentally affects Piedmont residents. This policy applies to such sources as the Oakland Rose Garden, I-580, and Oakland and San Francisco International Airports.

Piedmont City Code

Section 12.8 of the Piedmont City Code (Piedmont 2023) identifies nuisance noise as loud, unnecessary, and unusual noise. To evaluate whether a noise is a nuisance, the ambient noise level, the sound level of the objectionable noise, the intensity of the noise, whether the noise is continuous or intermittent, the duration and tonal content of the noise, the proximity of the noise to sleeping facilities, the zoning of the area, and the nature of the source all are considered.

- Notwithstanding any other provision of this Code, and in addition thereto, it is unlawful for any person to willfully make or continue or cause to be made or continued or to allow any animal to make or continue to make any loud, unnecessary, or unusual noise which disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. Such noise is declared to be a nuisance.
- 12.8.1 Standards to Be Considered. The standards which shall be considered in determining whether a violation of the provisions of this section exists shall include, but not be limited to, the following:
  - (a) The sound level of the objectionable noise;
  - (b) The sound level of the ambient noise;
  - (c) The proximity of the noise to residential sleeping facilities;
  - (d) The nature and zoning of the area from which the noise emanates;
  - (e) The density of the inhabitation of the area from which the noise emanates;
  - (f) The time day or night the noise occurs;
  - (g) The duration of the noise and its tonal content;
  - (h) Whether the noise is continuous, recurrent or intermittent;
  - (i) Whether the noise is produced by a commercial or non-commercial activity;
  - (j) The intensity of the noise;
  - (k) Whether the noise is natural or unnatural;
  - (l) Whether the noise is usual or unusual.
- 12.8.2 Prohibited Noise. In addition to the prohibition described in paragraph 12.8.1, the following noise is specifically prohibited:
  - (a) Construction and Demolition. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition activities between the hours of 6:00

p.m. and 8:00 a.m. each day, Sunday evening through Saturday morning, and between the hours of 6:00 p.m. and 9:00 a.m. Saturday evening through Sunday morning.

- 12.8.3 Exceptions
  - (a) Emergency Repairs. Emergency work conducted by public service utilities or governmental agencies shall be exempt from the provisions of this ordinance; provided that in the case of such emergency work, the public service utilities or government agencies involved shall promptly contact the Piedmont Police Department prior to or within 30 minutes after commencing such emergency Offenses-Miscellaneous 12-5 work, providing the Police Department with the exact location of the work, the time anticipated to complete the work, the nature of the work to be performed, and whether any assistance from the Police Department or other City services are anticipated in connection with such emergency work.
  - (b) Other. The City Administrator may grant temporary written exceptions to the Noise Ordinance upon the showing of good cause by the applicant.

5.13.3 Impact Questions

The impact questions include all noise questions in the current version of CEQA Guidelines, Appendix G.

5.13.3.1 Impact Questions

The project's potential noise-related effects were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.13-19 and discussed in more detail in Section 5.13.4.

Table 5.13-19. CEQA Checklist for Noise

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

5.13.3.2 Additional CEQA Impact Questions

None.

5.13.4 Potential Impact Analysis

Project impacts related to noise were evaluated against the CEQA significance criteria and are discussed in the following sections. This section evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.13.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts related to noise were evaluated for each of the criteria listed in Table 5.13-19, as discussed in Section 5.13.5.3.

5.13.4.2 Applicant-Proposed Measures

PG&E will implement the following APMs:

APM NOI-1: General Construction Noise Management

PG&E will employ standard noise-reducing construction practices such as the following:

- Comply with manufacturer's muffler requirements on all construction equipment engines and ensure exhaust mufflers are in good condition.
- Turn off construction equipment when not in use, where applicable.
- Locate stationary equipment, construction staging areas, helicopter landing zones, and construction material areas as far as practical from sensitive receptors.
- Include noise control requirements for construction equipment and tools in specifications provided to construction contractors to the maximum extent practicable, including performing all work in a manner that minimizes noise.
- PG&E will provide written notice at least 1 week prior to planned construction activities to all sensitive receptors and residences within approximately 500 feet of construction sites, staging yards, access roads, and areas of drone use, and within approximately 1,000 feet of helicopter landing zones. PG&E also will post notices in public areas, including recreational use areas, within approximately 500 feet of the project alignment and construction work areas. The announcement will state approximately where and when construction will occur in the area, including areas of helicopter construction. Notices will provide tips on reducing noise intrusion – for example, by closing windows facing the planned construction. PG&E will identify a public liaison to respond to concerns of neighboring receptors during construction, including residents, about construction noise disturbance. PG&E also will establish a toll-free telephone number for receiving questions or concerns during construction and develop procedures for responding to callers. Contact information for reaching the PG&E public liaison officer by telephone or in person will be included in the notices and also posted conspicuously at the construction sites. PG&E will respond to questions or concerns received.

APM NOI-2: Noise Minimization with Portable Barriers

Compressors and other small stationary equipment used during construction of PG&E project components will be shielded with portable barriers if appropriate and if located within approximately 200 feet of a residence.

APM NOI-3: Noise Minimization with Quiet Equipment

Quiet equipment will be used during construction of PG&E project components whenever possible (for example, equipment that incorporates noise control elements into the design, such as quiet model compressors or generators, can be specified).

APM NOI-4: Noise Minimization through Direction of Exhaust

When in proximity to noise-sensitive uses, equipment exhaust stacks and vents will be directed away from those noise-sensitive uses where feasible.

APM NOI-5: Nighttime Noise Disruption Minimization through Residential Notification

In the event that nighttime construction is necessary for PG&E project components– for instance, if certain activities such as underground line splicing need to continue to completion – affected residents will be notified in advance by mail, personal visit, or door-hanger, and will be informed of the expected work schedule.

APM NOI-6: Helicopter Noise Minimization Measures

PG&E will select helicopter landing zones that are located at least 500 feet from occupied residences where feasible. Nearby residences will be notified at least 1 week ahead of helicopter operations to minimize concerns regarding helicopter noise.

APM NOI-7: Noise Minimization Equipment Specification

PG&E will specify general construction noise reduction measures that require the contractor to ensure that all equipment is in good working order, adequately muffled, and maintained in accordance with the manufacturers' recommendations.

APM NOI-8: Incorporate Vibration Assessment into Project Construction

Where pile driving may be required adjacent residential or commercial uses, final design efforts and construction methods will consider soils and hammer type and use when assessing potential for vibration. Vibration monitoring will be conducted during pile driving activities, or in response to a complaint, to confirm that vibration levels are within acceptable guidelines. Site-specific minimization measures such as modifying the type of hammer, reducing hammer energy, modifying hammer frequency, or using vibratory pile driving will be implemented as necessary to reduce the potential effects of off-site vibration. Monitoring may be reduced or eliminated when it has been established that these measures, if required, are effective for the site conditions.

5.13.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) **Would the project result in 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? *Less-than-Significant Impact.***

Construction

Noise ordinances along the Project route vary by jurisdiction (Table 5.13-13). The following analysis provides noise estimates at the nearest sensitive receptors for the typical construction with five pieces of equipment described in Section 5.13.2.1 by construction work stream and section of the alignment.

Modify Moraga Substation

Moraga Substation is within the City of Orinda. The City of Orinda exempts construction from the noise ordinance maximum noise level at receiving properties but establishes limits to the time of day when construction can be performed. Construction is limited to 8:00 a.m. to 6:00 p.m., Mondays through Fridays, and 10:00 a.m. to 5:00 p.m. on Saturdays. No construction is to be performed on Sundays or major holidays. No heavy construction equipment is to be used on Saturdays or Sundays, but an exemption to allow use may be granted. All work at Moraga Substation will take place within existing PG&E property and will involve changing out equipment to be compatible with the new conductors and looping the new OPGW into existing control equipment. Modifications to the system protection hardware packages will occur within the substation's control buildings or enclosures following installation of the replacement circuit breakers, air switches, conductor and looping in of the OPGW. These upgrades will include the addition of new relays and associated mounting infrastructure. System protection upgrade construction occurring within substation control buildings or enclosures will range between approximately 1 day for setting adjustments to protective relay device modifications or up to 5 weeks for replacement of system protection devices. Installing the new OPGW and replacement conductor to their terminals within the substation and replacement of circuit breakers and air switches will occur outside of substation buildings or enclosures. A forklift will be used for approximately two days when the two circuit breakers are replaced in the existing outdoor equipment located in the western side of the substation where the existing lines terminate. The closest receptors to the substation work area where the forklift will operate are approximately 575 feet to the south of the substation. The estimated noise level for typical construction activities using heavy equipment at this distance will be approximately 65 dBA. A staging area is adjacent to the substation work area. The project's expected substation staging area is commonly used for non-project substation activities and is approximately 100 feet to the north of the closest receptors. Using the noise level for typical construction activities, a conservative estimated noise level will be approximately 79 dBA. A helicopter landing zone is not anticipated to be required within the substation staging area. The closest receptors to the staging area are approximately 160 feet to the south. The estimated noise level for typical construction at this distance will be approximately 75 dBA; however, activity at the staging area typically will not require multiple pieces of heavy machinery to operate simultaneously and will be quieter than typical construction activity estimates.

Rebuild Overhead Lines – Eastern Section

There are approximately 71 residences within 1,000 feet of the eastern section of the power line and associated work areas. All these residences are within the City of Orinda or the City of Oakland and the sensitive receptors closest to work areas are near Moraga Substation or work areas associated with the central section. The eastern section of the power line is in unincorporated Contra Costa County other than the four easternmost towers, which are in the City of Orinda. No noise ordinance has been established for unincorporated Contra Costa County and no sensitive receptors are located within this jurisdiction. The closest residence to a work area associated with the eastern section in the City of Orinda is approximately 620 feet, with an estimated noise level from typical construction of approximately 65 dBA. Helicopters are expected to be used to lift structures and support reconductoring and OPGW installation in the eastern section of the project. Six potential landing zones are identified in the eastern section of the project. Five of the potential landing zones are more than 2,000 feet from the closest residence in the City of Orinda, in the City of Oakland, or in the community of Canyon. A potential landing zone for helicopters near the southern extent of the Wilder community in the City of Orinda is located approximately 225 feet from the closest residence.

The City of Oakland established noise limits based on short-term (less than 10 days) or long-term (more than 10 days) construction duration. The closest residence to an eastern section work area in the City of Oakland is approximately 130 feet, resulting in an estimated noise level from construction of approximately 77 dBA. These estimated levels exceed both the short-term (80 dBA) and long-term (65 dBA) daytime, weekday noise limits for construction at residential receiving properties.

Rebuild Overhead Lines – Central Section

The central section of the project is between the top of the Oakland Hills and SR 13 within the jurisdiction of the City of Oakland. The City of Oakland established noise limits based on short-term (less than 10 days) or long-term (more than 10 days) construction duration. At each structure location, construction activities will be short term (typically several days) and temporary and are planned to take place between 7:00 a.m. and 7:00 p.m. There are approximately 1,362 sensitive receptors within 1,000 feet of the central section. Of these receptors, approximately 129 sensitive receptors are within 100 feet and approximately 30 sensitive receptors are within 50 feet of work areas. At 100 feet, the estimated noise level from construction is approximately 79 dBA and at 50 feet, it is approximately 84 dBA. These estimated noise levels exceed both the short-term (80 dBA) and long-term (65 dBA) daytime, weekday noise limits for construction at residential receiving properties.

Rebuild Western Portion Underground – Western Section

The western section of the project is between SR 13 and Oakland X Substation, with most of the work area within the City of Oakland and a portion within the City of Piedmont. It primarily includes the rebuild of the western portion underground, as well as a small part of rebuilding the overhead lines. There are approximately 2,980 sensitive receptors within 1,000 feet of the western section of the power lines west of SR 13. Of these receptors, approximately 380 sensitive receptors fall within 100 feet of the lines to be rebuilt or corresponding work areas, and approximately 119 sensitive receptors are within 50 feet. At 100 feet, the estimated noise level from construction is approximately 79 dBA and at 50 feet, it is approximately 84 dBA. Pile driving may occur during construction of the underground portion of the project. At 100 feet, the estimated noise level from pile driving is approximately 88 dBA and at 50 feet, it is approximately 94 dBA. These estimated levels exceed both the short-term (80 dBA) and long-term (65 dBA) daytime, weekday noise limits established by the City of Oakland for construction at residential receiving properties. The City of Piedmont has not established maximum noise limits, but prohibits loud, unnecessary, or unusual noise that disturbs the peace and quiet of any neighborhood and further restricts construction to daytime only from 8:00 a.m. to 6:00 p.m., Monday through Friday.

Modify Oakland X Substation

Oakland X Substation is located within the City of Oakland. There are approximately 445 sensitive receptors within 1,000 feet of Oakland X Substation. Sensitive receptors surround the substation, with the closest receptor located approximately 40 feet to the north. Work within Oakland X Substation will not require heavy machinery and will be conducted primarily indoors. All work at Oakland X Substation will take place within existing PG&E property and will involve changing out equipment to be compatible with the new conductors and looping the new OPGW into existing control equipment. Modifications to the system protection hardware packages within local control buildings will be required following installation of the conductor and looping in of the OPGW. These upgrades within the substation building will include replacement of existing buses and air disconnect switches and the addition of new relays and associated mounting infrastructure. The duration of the protective relay device modifications could be 1 day for setting adjustments or up to 5 weeks for replacement of system protection devices. Use of heavy equipment to replace substation equipment is expected to be limited to a forklift to support equipment delivery and removal (approximately 1 day). Expected noise levels from construction, therefore, are expected to be less than the estimated typical construction noise levels.

Summary

Based on this analysis, because construction activities will be conducted close to residences, a substantial temporary increase in noise will result; however, construction will result in less-than-significant impacts with implementation of APM NOI-1 through APM NOI-7.

Although noise levels from construction activities exceed noise limits established by local jurisdictions, construction of most project components at any given location will occur for a short period of time and will move along the length of the lines. PG&E is exempt from local noise standards as stated in

Section 5.13.3.3. Equipment use will be temporary, intermittent, and restricted to the 20- to 24-month construction period. Given the limited and intermittent duration of construction activity at any one location, impacts under this criterion will be less than significant with the implementation of APM NOI-1 through APM NOI-7. Construction within each work area as anticipated to be short term, lasting between a few days to 2 to 3 weeks with intermittent and nonconsecutive days, further minimizing the total duration of elevated noise experienced by any one sensitive receptor. Construction will mostly occur Monday through Saturday between the hours of 7:00 a.m. and 5:30 p.m., when certain sensitive receptors such as residences are least sensitive to elevated noise levels. Construction activities with the longest duration are at some staging areas and at the substations, which will not require multiple pieces of heavy equipment and most of the work will be located indoors. The implementation of APMs also will minimize exposure to construction noise. For example, if construction outside of noise ordinance-limited hours is necessary to accommodate planned electrical outages (clearances) scheduled at night, PG&E will implement APM NOI-1 and APM NOI-5, which require advance notice to property owners near construction activities.

Operation and Maintenance

Audible noise on power lines and structures is caused by the effects of corona and the electric field gradient. Corona and the electric field gradient are functions of line voltage, altitude, conductor diameter, and condition of the conductor and the suspension hardware. The noise emissions from a power line increase under wet conductor conditions because the surface irregularities resulting from the formation of water droplets on the outer surface of the conductors concentrate the electric field. Resistive heating of the conductor under load increases the conductor temperature and evaporates surface moisture. Thus, audible noise from a power line generally is evaluated for foul weather, which generally is defined as periods with measurable precipitation (nominally, 1 millimeter per hour). During heavy rain, the sound of the rain itself is expected to exceed that of the power line. Newly constructed power lines may generate a higher level of noise for a short period (typically, 1 year) and then will level off to a lower audible noise level. This happens during the initial weathering phase, which is the time when any residual surface oil from the manufacturing of the line or other irregularities resulting from the construction process dissipates. Corona typically becomes a design concern for transmission lines at 345 kV and higher.

The updates to the 115 kV power line are not predicted to cause any noise sensitive receptor to exceed 45 dBA during foul weather conditions. When initially energized and for a period expected to last less than approximately 1 year, there is potential for new conductor effects associated with drawing oil and residual grease on the new conductor surfaces to increase the audible noise level temporarily and nominally. The conductor's nonspecular finish will minimize the duration and magnitude of the potential new conductor effects.

Proposed changes to Moraga Substation and Oakland X Substation do not add significant new sources of noise. No changes to buildings, structures, or fencing will occur at either substation. The project will not add transformer banks or any other new noise-producing equipment at the substations. Thus, no substantial increases in sound levels at noise sensitive receptors in the vicinity of Moraga Substation and Oakland X Substation is anticipated. The impacts from operation noise will be less than significant.

Maintenance activities for the rebuilt power lines generally are expected to be the same as existing maintenance activities and typically will occur over short timeframes and generate minimal noise. Therefore, during operation and maintenance, no exposure of persons to or generation of noise levels in excess of standards established in the local general plans or noise ordinances, or applicable standards of other agencies, is anticipated, and maintenance and operations will have a less-than-significant impact.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? *Less-than-Significant Impact*.

Construction

General construction equipment has the potential to exceed the vibration damage criteria (refer to Table 5.13-9) if within 25 feet of a structure. Impact pile driving generates the highest levels of vibration and has the greatest potential to cause damage; for the upper range in vibration from impact pile driving, 135 feet is the closest that pile driving can occur to a Category 4 building. For a more typical level of impact pile driving, the distance is reduced to 75 feet. For typical vibratory pile driving, the distance is 30 feet. Category 4 buildings are "extremely susceptible to vibration damage" with construction very sensitive to vibration; these may be objects or buildings of historic interest. Pile driving will be limited in duration and only be used for construction of the underground portion of the project. Category 4 buildings are not expected to occur within 135 feet of impact pile driving and this distance is reduced to 30 feet for typical vibratory pile driving. Nevertheless, APM NOI-8 will be implemented to require a vibration assessment that will consider site-specific factors and be incorporated into project construction. Additionally, groundborne vibration and noise will occur during daytime hours and will be short term in duration. Therefore, construction of the proposed project will result in a less-than-significant impact.

Operation and Maintenance

Equipment associated with normal operation and maintenance of the proposed project will not produce any groundborne noise or vibration; therefore, operation and maintenance of the project will result in no impact.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? *No Impact.*

Construction, operation, and maintenance of the project components will occur at a distance greater than 2 miles from a public airport; therefore, the project will result in no impact under this criterion.

5.13.4.4 CPUC Draft Environmental Measures

No noise measures were included in the CPUC Draft Environmental Measures.

5.14 Population and Housing

This section describes existing conditions and potential impacts on population and housing as a result of project construction, operation, and maintenance. The analysis concludes that the project will have no impact on population and housing. The project's potential effects on population and housing were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.14-1 and discussed in more detail in Section 5.14.4.

5.14.1 Methodology and Environmental Setting

To evaluate potential effects on population and housing resources, the housing elements of local general plans, associated environmental review documents, hotel vacancy data (AHLA 2023), and state and federal demographic data were reviewed. The data and project information were evaluated to assess impacts according to the CEQA significance criteria in Table 5.14-1. The population and growth data and the project purpose and need were reviewed for use in evaluating whether the project could indirectly induce growth or displace housing or people. This section evaluates potential project impacts from both the construction phase and the operation and maintenance phase.

5.14.1.1 Population Estimates

In 2022, Contra Costa County had an estimated population of 1,149,586 people (CDF 2023). The California Department of Finance (CDF) projects that the county will have a population of approximately 1,171,945 by 2030 and 1,361,137 by 2050 (CDF 2023). Within the county, the City of Orinda had a population of approximately 19,078 in 2021 and is projected to reach 20,200 people by 2040 (City of Orinda 2023a). The eastern section of the project, including Moraga Substation, is located within Contra Costa County.

As of 2021, the City of Oakland had a population of approximately 433,797 people; the population is projected to be 554,325 by 2030 (City of Oakland 2023a). The central portion and nearly all of the western portion of the project, including Oakland X Substation, are within the City of Oakland.

The City of Piedmont had an estimated population of 10,793 in 2023; the city's proposed Housing Element estimates the population will increase to approximately 13,727 by 2031(City of Piedmont 2023). A small portion of the project that includes four structures to be removed, two transition structures to the underground segment, and temporary construction work areas are located in Piedmont.

5.14.1.2 Housing Estimates

As of 2022, Contra Costa County had approximately 430,081 housing units (U.S. Census Bureau 2021). The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), in their *Plan Bay Area 2050: Final Blueprint Growth Pattern*, project a total of 551,000 households in the county by 2050 (ABAG/MTC 2021). Within the county, the City of Orinda had approximately 6,850 households in 2021 and is projected to reach 6,935 households by 2040 (City of Orinda 2022).

The City of Oakland had approximately 169,959 households in 2020 (City of Oakland 2023a) and is estimated to have approximately 187,734 households by 2023 (CDF 2023b). The buildout program in the city's proposed Phase 1 2045 General Plan Update anticipates up to approximately 39,377 additional households by 2030 (City of Oakland 2023a).

The City of Piedmont had approximately 3,979 housing units, with a vacancy rate of 3.2 percent in 2023; the city's proposed Housing Element estimates approximately 1,048 additional housing units by 2031 (City of Piedmont 2023).

5.14.1.3 Approved Housing Developments

Oakland Planning Bureau's Major Planning Projects (City of Oakland 2023b) and Orinda's Major Development Projects (City of Orinda 2023b) were checked for proposed housing development projects. Unincorporated Contra Costa County within 1 mile of the project is dedicated open space and will not have residential development. Proposed and approved housing development projects within 1 mile of the project include the following:

- The City of Orinda approved the Final Development Plan for the Wilder Subdivision, located at State Route 24 and Wilder Road, on November 29, 2005 (City of Orinda 2023b). The plan for the 1,500-acre site includes 245 homes, community facilities, and 1,300 acres of open space. With an average of 2.78 persons per household (City of Orinda 2022), the development would have approximately 681 residents. As of November 2023, construction on 230 lots has been completed.
- The City of Orinda approved the Country House Memory Care Project on January 29, 2019. The project site is located at 1 Wilder Road and would accommodate 38 people in assisted living units (City of Orinda 2019). As of November 2023, construction has not started on the project.
- The City of Oakland has approved or is pending approval of the following proposed residential projects:
  - A 3,718-square-foot single-family dwelling unit on Ashmount Avenue. As of December 2023, it is approved pending appeal.
  - A six-story multi-family residential development at 2805 Park Boulevard. The proposal includes 20 units (City of Oakland 2016); with an average of 2.52 persons per household (City of Oakland 2023a), the project would have approximately 50 residents. As of December 2023, it is approved pending appeal.
  - An approved rezoning for a new market-rate 25-unit residential development at 601 MacArthur Boulevard. With an average of 2.52 persons per household (City of Oakland 2023a), the proposal would have approximately 63 residents. As of December 2023, construction has not started.
  - Redevelopment of a vacant parking lot at 500 Grand Avenue with a mixed-use commercial and residential building, which would include 40 residential units (City of Oakland 2017). With an average of 2.52 persons per household (City of Oakland 2023a), the project would have approximately 100 residents. As of December 2023, the permit had been extended.
  - A new multi-family mixed-use project proposed at 347 East 18th Street. It would include 27 residential units (SF YIMBY 2022); with an average of 2.52 persons per household (City of Oakland 2023a), the project would have approximately 68 residents. As of December 2023, the project is approved pending appeal.
- The City of Piedmont has included Implementation Program 1.L in its Housing Element that calls for preparation of the Moraga Canyon Specific Plan (MCSP) to accommodate residential development of up to 199 units on approximately 18 acres of city-owned land (City of Piedmont 2023). With an average of 2.8 persons per household (City of Piedmont 2023), the master plan would accommodate approximately 557 residents. As of December 2023, the Housing Element has not been approved, nor has work commenced to develop the MCSP.

None of these housing development projects overlap with the project footprint. Therefore, no developers were contacted as part of the project outreach.

5.14.2 Regulatory Setting

No regulatory background information is relevant to addressing potential project-related impacts on population and housing.

5.14.3 Impact Questions

5.14.3.1 Impact Questions

The project's potential effects on population and housing were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.14-1 and discussed in more detail in Section 5.14.4.

Table 5.14-1. 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 unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

5.14.3.2 Additional CEQA Impact Questions

None.

5.14.4 Potential Impact Analysis

5.14.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. In accordance with Appendix G of the CEQA Guidelines, the potential significance of project impacts on population and housing were evaluated for each of the criteria listed in Table 5.14-1, as discussed in Section 5.14.4.3.

5.14.4.2 Applicant-Proposed Measures

The project will have no impact on population and housing, so no Applicant-proposed measures are recommended.

5.14.4.3 Potential Impacts

Project impacts related to population and housing were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase. The impact discussion is organized to describe the effects that the project has on the environment.

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? *No Impact*.

The project will improve reliability of electric service for a large section of Oakland and Piedmont served by Oakland X Substation. The project will not extend new power lines or other infrastructure into areas not already served, and the project does not facilitate growth that has not already been accounted for in long-term planning documents. Although the project will improve electric transmission reliability by rebuilding aging infrastructure, power availability and reliability in this fully urbanized area are not constraints to population growth in Oakland and Piedmont.

During peak construction times, PG&E will employ approximately 117 workers on the project (including workers, supervisors, and inspectors), who are expected to come from the local workforce. However, there are adequate hotel and motel accommodations within Oakland and the greater East Bay Area to provide accommodations if any construction workers are to temporarily relocate to the area during construction. PG&E will operate the rebuilt power lines using existing operation and maintenance staff. Thus, the project will not directly or indirectly induce population growth.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? *No Impact*.

Although existing homes occur adjacent to work areas in several locations, no demolition of homes will be done as part of the project. Temporary relocation of residents inconvenienced by construction activities adjacent to their residences may occur as a result of the proposed project. No new housing is proposed in the project area. Construction, operation, and maintenance of the project will not displace existing housing or people, nor will replacement housing need to be constructed; therefore, no impact will occur.

5.15 Public Services

This section describes existing conditions and potential impacts on public services as a result of construction, operation, and maintenance of the project, and concludes no impacts will occur. Public services include fire and emergency protection, police protection, and maintenance of public facilities such as schools and parks. Emergency access is discussed in Section 5.17, Transportation and Traffic. Temporary construction-related impacts on schools and parks—such as dust and noise—are discussed in Sections 5.3, Air Quality, and 5.13, Noise, respectively. Project compatibility with future park-planning efforts is discussed in Section 5.11, Land Use and Planning. Potential impacts to parks and recreational facilities are discussed in Section 5.16, Recreation. The project's potential effects on public services were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.15-4 in Section 5.15.3 and discussed in more detail in Section 5.15.4.

5.15.1 Methodology and Environmental Setting

This section was prepared based on reviews of the *Contra Costa County General Plan* (Contra Costa County 2000); *City of Orinda General Plan* (City of Orinda 1987); *City of Oakland General Plan* (City of Oakland 2023a); and the *City of Piedmont General Plan* (City of Piedmont 2009). The websites and online maps were reviewed for police, fire services, schools, and parks in the four jurisdictions.

Descriptions of fire, police, schools, parks, and hospitals in each local jurisdiction are provided in the following subsections. Public services and facilities that could serve the project and schools within 0.25 mile of project components are shown on Figure 5.15-1.

5.15.1.1 Fire Protection

The project passes through the jurisdiction of several agencies that provide fire services. Table 5.15-1 provides a summary of fire stations, as well as police stations described in Section 5.15.1.2, and their approximate distances from the project. Fire protection services are described in more detail in the subsections that follow.

Table 5.15-1. Nearest Fire and Police Stations to the Proposed Project

Station	Address	Approximate Distance from Project
Fire Stations		
Orinda Fire House 44	295 Orchard Road, Orinda	0.8 mile
Oakland Fire Station 24	5900 Shepard Canyon Road, Oakland	Adjacent to the project
Oakland Fire Station 16	3600 13th Avenue, Oakland	0.1 mile
Oakland Fire Station 6	7080 Colton Boulevard, Oakland	0.4 mile
Piedmont Fire Station	120 Vista Avenue, Piedmont	1.25 miles
Police Stations		
Contra Costa County Valley Station	150 Alamo Plaza, Alamo	6.75 miles
City of Orinda Station	22 Orinda Way, Orinda	1.9 miles
Alameda County Sheriff Peralta Police Station	333 East 8th Street, Oakland	1.8 miles
Oakland Eastmont Police Station	2651 73rd Avenue, Oakland	3.7 miles
Piedmont Police Station	403 Highland Avenue, Piedmont	1.0 mile

City of Orinda

The portion of the project in the City of Orinda is served by the Moraga-Orinda Fire Protection District (MOFPD). The District encompasses 42 square miles, protecting approximately 38,500 residents in a combination of urban, suburban, and rural areas as well as open spaces, regional parks, and recreation areas (MOFPD 2023). There are approximately 14,091 parcels within the District, and it responds to more than 3,000 incidents annually with 5 fire stations throughout the District (MOFPD 2023).

The closest fire station is Fire House 44, which is approximately 0.8 mile from Moraga Substation at 295 Orchard Road in Orinda. This station houses three firefighters and has a T44 Pierce 2017 100-foot Tiller Truck, a WT44 2009 Pierce/Kenworth Water Tender with a 2,500-gallon tank and 1,000 gallons per minute (gpm) pump, and an E644 2019 Type VI wildland pumper with a 300-gallon tank and 300 gpm pump as the primary equipment (MOFPD 2023).

Contra Costa County

The portion of the project in unincorporated Contra Costa County is a State Responsibility Area (SRA). CAL FIRE is responsible for fire prevention and suppression in the SRAs as described in Section 5.20, Wildfire.

City of Oakland

Fire protection in the City of Oakland is provided by the City of Oakland Fire Department (OFD). In the 2020-2021 fiscal year, OFD employed 435 full-time equivalent firefighters and officers and 85 civilians, with 25 stations in its service area (City of Oakland 2023b). During 2021, the OFD had 53,351 emergency responses, 3,210 fires extinguished, and 8,432 inspections (City of Oakland 2023b). As of March 2021, the total response time (90 percent of the time) was 8 minutes and 26 seconds (City of Oakland 2023b).

According to a City of Oakland WebMap of public services, the nearest fire stations in Oakland are Station 24, Station 16, and Station 6. Fire Station 24 is at 5900 Shepard Canyon Road, Fire Station 16 is at 3600 13th Avenue, and Fire Station 6 is at 7080 Colton Boulevard. All three fire stations provide ambulance and fire services to the City of Oakland (CountyOffice.org 2023).

City of Piedmont

Fire protection in the City of Piedmont is provided by the Piedmont Fire Department (PFD), which consists of a single fire station and 24 line personnel across 3 shifts (PFD 2023a). The fire station is located at 120 Vista Avenue in Piedmont and is approximately 1.25 miles north of the project alignment. The fire department has one Type 1 Fire Engine, one Type 2 Fire Truck, and one Type 2 Rescue Ambulance (PFD 2023b). In 2022, the PFD responded to 997 calls, including 36 fire-related incidents and 422 emergency medical incidents (City of Piedmont 2023). Response times are not publicly available.

5.15.1.2 Police

Contra Costa County and City of Orinda

The Contra Costa County Sheriff's Office is responsible for policing the unincorporated areas of the County, contract cities (Orinda, Lafayette, and Danville), and special districts (Contra Costa County Sheriff 2023a). The Contra Costa County Sheriff's Office serves more than 1 million residents in the 715 square miles of the County. They respond to more than 600,000 calls for services (Contra Costa County Sheriff 2023a).

The *Contra Costa County General Plan* includes Public Protection Policy 7-58, which states that the sheriff patrol beats will be configured to assure minimum response times. Policy 7-59 identifies a maximum response time goal for priority 1 or 2 calls of 5 minutes for 90 percent of all emergency responses in the central business district, urban, and suburban areas (Contra Costa County 2005).

The Contra Costa County Sheriff's Valley Station Patrol Division service area includes the unincorporated County area. The Valley Station, located at 150 Alamo Plaza in the City of Alamo, is an approximately 20-minute drive to Moraga Substation, the nearest point of the project Contra Costa County Sheriff 2023c).

The City of Orinda contracts its police services from the Contra Costa County Sheriff's Office (COPD 2023). The City of Orinda Police Department (COPD) has a staff of 14 police personnel and serves approximately 18,681 people across 12.7 square miles (Contra Costa County Sheriff 2023b). The COPD is an approximately 8-minute drive to Moraga Substation, the nearest point of the project.

City of Oakland

The City of Oakland Police Department provides law enforcement services to the City of Oakland. It is broken up into 5 police areas and 35 beats (OPD 2021). The project components within the City of Oakland overlap with Police Areas 2, 3, and 4, and Beats 13Z, 22X, 21Y, and 16Y (OPD 2021). Oakland Police Department headquarters is located at 455 7th Street in downtown Oakland; the Eastmont Police Station is at 2651 73rd Avenue. In addition, the Alameda County Sheriff's office operates the Peralta Police Station at 333 East 8th Street in Oakland, an approximately 8-minute drive to the nearest project location at Oakland X Substation.

Official response times for the City of Oakland were unavailable; however, a 2023 article from the San Francisco Standard states that as of 2022, the average police response time is 19.1 minutes (Lamb 2023).

City of Piedmont

The Piedmont Police Department (PPD) employs 20 sworn personnel and 8 non-sworn personnel. The PPD responds to an average of 27 calls per day, and calls are handled through a computerized system that is shared with the fire department. The PPD is divided into two patrol areas (Piedmont 2009). The project falls within Beat 1, the city limits east of Highland Avenue. The Piedmont police station is at 403 Highland Avenue in Piedmont. The PPD is an approximately 7-minute drive from the nearest project location at the intersection of Park Boulevard and Estates Drive. Response times are not publicly available.

5.15.1.3 Schools

The Oakland Unified School District has schools located within 0.25 mile of the project. In addition, several preschools and private schools are within 0.25 mile of the project, including one in the City of Piedmont. The schools, and their approximate distances from the project, are shown in Table 5.15-2. One school in the Orinda Union School District is slightly outside the 0.25-mile radius but has been included for informational purposes. No schools in unincorporated Contra Costa County are located within 0.25 mile of the project.

Orinda Union School District

The Orinda Union School District serves the City of Orinda and includes four elementary schools and one middle school (Orinda Union School District 2023). Del Rey Elementary School at 25 El Camino Moraga in Orinda is within 0.25 mile of the project.

Oakland Unified School District

The Oakland Unified School District is within the Alameda County Office of Education and serves the project area within the City of Oakland. This district includes 45 elementary schools, 4 kindergarten through 8th grade schools, 11 middle schools, 16 high schools (including grades 6 to 12, 9 to 12, and 11 and 12), 4 alternative schools, special education services, and adult education (Oakland Unified School District 2023). The Oakland Unified School District Joaquin Miller Elementary School, Glenview Elementary School, Edna Brewer Middle School, Montera Middle School, and Oakland High School are within 0.25 mile of the project components. In addition, several preschools and private schools in Oakland are within 0.25 mile of the project components.

Piedmont

The project is within 0.25 mile of one private school within the City of Piedmont. The Corpus Christi School is a kindergarten through 8th grade Catholic school (Corpus Christi School 2023).

Table 5.15-2. Schools within 0.25 Mile of the Proposed Project

School Name (Jurisdiction)	Address	Approximate Distance from Nearest Project Area
Del Rey Elementary (Orinda Unified School District [USD])	25 El Camino Moraga, Orinda	0.3 mile southeast of Moraga Substation.
Joaquin Miller Elementary (Oakland USD)	5525 Ascot Drive, Oakland	0.15 southeast of project ROW.
Montera Middle School (Oakland USD)	5555 Ascot Drive, Oakland	School yard, potential staging, is 100 feet east of ROW with existing access from Scout Road through parking lot.
Open Minds Early School and Academia De Mi Abuela (Private)	2162 Mountain Boulevard, Oakland	0.21 mile west of potential staging area adjacent to EN21 and EN23.
Sequoia Nursery School (Private)	2666 Mountain Boulevard, Oakland	0.24 mile north of potential staging area at Lincoln Avenue and Monterey Boulevard.
Growing Light Montessori School (Private)	4700 Lincoln Avenue, Oakland	0.1 mile southwest of potential staging area at Lincoln Avenue and Monterey Boulevard.
KSS Immersion Preschool of Oakland (Private)	2540 Charleston Street, Oakland	0.25 mile southwest of potential staging area at Lincoln Avenue and Monterey Boulevard.
Head Royce School (Private)	4315 Lincoln Avenue, Oakland	0.17 mile southwest of potential staging area at Lincoln Avenue and Monterey Boulevard.
Ability Now Bay Area (Private)	4500 Lincoln Avenue, Oakland	0.18 mile southwest of potential staging area at Lincoln Avenue and Monterey Boulevard.
Corpus Christi School (Private)	1 Estates Drive, Piedmont	School yard, a potential staging area, is immediately south of EN29 and ES31 work area.
Gan Mah Tov Preschool (Private)	3778 Park Boulevard, Oakland	200 feet south of underground construction on Park Boulevard.
Duck Pond Preschool (Private)	3947 Park Boulevard, Oakland	North side of roadway, adjacent to underground construction on Park Boulevard.
Les Petite Francophones (Private)	4101 Park Boulevard, Oakland	North side of roadway, adjacent to underground construction on Park Boulevard.
Crocker Highlands Elementary (Oakland USD)	525 Midcrest Road, Oakland	0.19 mile northwest of the staging areas located at the end of Wellington Street.
Glenview Elementary (Oakland USD)	4215 La Cresta Avenue, Oakland	0.12 mile southwest of underground construction on Park Boulevard.
Edna Brewer Middle School (Oakland USD)	3748 13th Avenue, Oakland	50 feet south of underground construction on Park Boulevard.

Table 5.15-2. Schools within 0.25 Mile of the Proposed Project

School Name (Jurisdiction)	Address	Approximate Distance from Nearest Project Area
Oakland High School (Oakland USD)	1023 MacArthur Boulevard, Oakland	0.14 mile west of Oakland X Substation.

5.15.1.4 Parks

The project overlaps two EBRPD parks, the Huckleberry Botanic Regional Preserve and the Sibley Volcanic Regional Preserve. In addition, the project overlaps two regional parks in the City of Oakland, Shepherd Canyon Park and Dimond Park/Dimond Canyon. Project construction work areas are located on or adjacent to several school parks, playgrounds, or athletic fields, including Montera Middle School and Corpus Christi School. Information about recreational resources is provided in Section 5.16, Recreation.

5.15.1.5 Hospitals

The nearest hospitals and urgent cares to the project that could provide service to the project are Sutter Urgent Care in Orinda, Highland Hospital in Oakland, and CityHealth Urgent Care in the Montclair area of Oakland (Google 2023). As the crow flies, Sutter Urgent Care at 12 Cam Encinas in Orinda is an approximately 6-minute drive (approximately 2.5 miles) from Moraga Substation or (approximately 1.2 miles) from the nearest landing zone/staging area. Highland Hospital at 1411 East 31st Street in Oakland is approximately 0.4 mile, or a 7-miutes drive, from Oakland X Substation. CityHealth at 1970 Mountain Boulevard in Oakland is approximately 0.3 mile from the project, or less than 5-minute drive from the nearest project location. Table 5.15-3 provides a summary of the hospitals and urgent care facilities, their addresses, and distances from the project.

Table 5.15-3. Hospitals Near the Proposed Project

Hospital Name	Address	Approximate Distance from Project
Sutter Urgent Care – Orinda	12 Cam Encinas, Orinda	1.45 miles from nearest staging area; 2.5 miles from Moraga Substation
Highland Hospital	1411 E 31 Street, Oakland	0.4 mile from Oakland X Substation
CityHealth	1970 Mountain Boulevard, Oakland	0.3 mile from structures EN20/ES22

5.15.2 Regulatory Setting

No regulatory background information is relevant to addressing potential project-related impacts on public services.

5.15.3 Impact Questions

5.15.3.1 Impact Questions

The impact questions include all public services impact questions in the current version of CEQA Guidelines, Appendix G.

The project's potential effects on public services were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.15-4 and discussed in more detail in Section 5.15.4.

Table 5.15-4. 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) 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?	☐	☐	☐	☒

5.15.3.2 Additional CEQA Impact Questions

None.

5.15.4 Potential Impact Analysis

5.15.4.1 Potential Impact Analysis

Project impacts related to public services were evaluated against the CEQA significance criteria and are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.15.4.2 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on public facilities were evaluated for each of the criteria listed in Table 5.15-2, as discussed in Section 5.15.4.

5.15.4.3 Applicant-Proposed Measures

The project will have no impact on public services that will create the need for new or physically altered government facilities and no APMs are included. However, APM TRA-1: PG&E Temporary Traffic Controls, described in Section 5.17, addresses emergency response and access in the project area during construction. Construction activities that are in, along, or cross local roadways will follow best management practices and local jurisdictional encroachment permit requirements – such as traffic controls in the form of signs, cones, and flaggers – to minimize impacts on traffic and transportation, including response times and emergency vehicle access.

5.15.4.4 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

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? *No Impact*.**

Project construction will result in a temporary short-term increase of up to approximately 117 construction workers. Although construction workers traveling to the project may use existing public services or amenities, this potential increase in demand will be minimal and temporary and will not require new or altered government facilities. The project will not create permanent employment or displace people. The project will not include development of new residential units that will directly or indirectly increase population; therefore, no increase in the demand for public services in the area will occur. Furthermore, no new or altered public facilities are needed. Therefore, no construction impact will occur. Operation and maintenance visits will be conducted occasionally by PG&E staff but no increases in staff levels will be required that will trigger the need for new or altered facilities that could result in environmental impacts. Therefore, no operations or maintenance impacts will occur. Details are provided by service type in the following sections.

Fire and Police Protection

No new or altered fire or police protection facilities will be required to maintain existing response times or service ratios. In the unlikely event of fire at the project site, fire protocols described in Section 5.20, Wildfire, will be followed. Construction vehicles and equipment will access project construction areas by using existing paved, dirt, or gravel roads and overland travel routes. Construction vehicles and equipment will be staged or parked within project construction areas. Further, as described in Section 5.17, Transportation and Traffic, during project construction, PG&E will coordinate any road closures with city and county officials and emergency service providers so that response times are not affected. The project will not impede ingress and egress of emergency vehicles and will not affect emergency response times during project construction. Occasional maintenance of the underground portion of the rebuilt lines will require a lane closure for work at a vault. PG&E will coordinate any lane closures with city and county officials and emergency service providers so that response times are not affected. Therefore, no impact will occur. In addition, the implementation of APM TRA-1: Temporary Traffic Controls, will help facilitate emergency access during construction; for example, through signage and flaggers indicating detours during temporary lane or road closures.

Schools

The project will not involve developing new residential units or services that will generate a new residential population in the area. Potential construction staging areas may include school yards and parking lots. Use of these school areas will be coordinated with the school and used only when school is not in session. Therefore, the project will not cause an increase in the demand on existing schools that will affect school enrollment or performance objectives. No new or altered school facilities will be required to serve workers during construction, and operation does not require new permanent workers; therefore, no impact on schools will occur.

Parks

Several public parks and recreation areas overlap with portions of the project (refer to Section 5.16). The project will not involve developing new residential units or services that will generate a new daytime or residential population in the area that will increase the demand on parks. Construction workers (up to approximately 117 at peak construction periods) traveling to the area may use existing public services or amenities such as parks; however, this potential increase in demand will be minimal and temporary and will not exacerbate the need for, or deterioration of, the park facilities nor result in the need for new facilities. Therefore, no impacts to public parks will occur. Potential construction- and operation-related recreation impacts to parks and other public facilities in the project area are evaluated in Section 5.16, Recreation.

Hospitals

Project construction will result in a temporary short-term increase of up to approximately 117 construction workers. Although construction workers traveling to the project may require the services of an existing hospital or urgent care facility, this potential increase in demand will be minimal and temporary and will not require new or altered facilities. The project will not include development of new residential units that will directly or indirectly increase the population; therefore, no increase in the demand for medical facilities in the area will occur. Therefore, no construction impact will occur. Operation and maintenance visits will be conducted occasionally by PG&E staff but no increases in staff levels will be required that will trigger the need for new or altered hospital facilities that could result in environmental impacts. Therefore, no operations or maintenance impacts will occur.

5.16 Recreation

This section describes existing conditions and potential impacts on recreational resources as a result of construction, operation, and maintenance of the project and concludes that less-than-significant impacts will occur in this area. The project's potential effects on recreational resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Tables 5.16-1 and 5.16-2 in Section 5.16.3 and discussed in more detail in Section 5.16.4.

5.16.1 Methodology and Environmental Setting

Recreational resources include state, local, and regional parks. To identify parks and recreation areas within one-half mile of the project, aerial maps were reviewed, the EBRPD website; the EBRPD Sibley Volcanic Regional Preserve Land Use Plan Amendment EIR; the City of Oakland General Plan OSCAR Element; East Bay Municipal Utility District website and East Bay Watershed Master Plan (EBMUD 2023); the Phase 1 Oakland 2045 General Plan Updates EIR; and the Oakland Parks and Recreation Foundation and the City of Piedmont's List of Parks, Sports Fields, and Dog Parks websites all were reviewed as part of the recreational resources evaluation. Refer to Figure 5.16-1 for parks and recreation facilities within one-half mile of the project.

5.16.1.1 Recreational Setting

Regional Setting

The East Bay hills define most of the project area. Numerous regional parks, open spaces, and city parks are in the hills throughout Alameda County and Contra Costa County. In these two counties, EBRPD works to acquire, manage, and preserve natural and cultural resources to protect them and to provide recreational activities and environmental education for people to enjoy. EBRPD encompasses 125,496 acres in 73 parks, with 1,330 miles of trails (EBRPD 2023a). A total of approximately 25 million people visited the parks in 2022 (Regional Parks Foundation 2023). The Regional Parks Foundation supports the EBRPD through fundraising to provide universal access, environmental stewardship, educational and recreational programs, and the acquisition of parklands.

As of 2022, the City of Oakland has 166 public parks totaling 4,927 acres (City of Oakland 2023). The city's Parks, Recreation & Youth Development Department manages recreation programs and 149 of the public parks, the remainder of which is managed either by EBRPD or the Port of Oakland. The City's OSCAR Element identifies 10 general categories of parks. The category with the largest parks is "region-serving parks," which are large recreation areas with diverse natural and human-made features, are typically 25 acres or larger, and are intended to serve the entire city (City of Oakland 1996). The category of "school playgrounds" includes the areas on public school properties that provide recreational facilities and play areas for students and that serve local neighborhoods.

Local Setting

The project footprint intersects with two EBRPD regional parks, a private swim and tennis club, two City of Oakland parks, two schools (one public and one private), the Montclair Railroad Trail (MRRT) linear park, and a private golf course. Each of these is discussed in the following subsections, generally from east to west along the project area.

EBRPD Sibley Volcanic Regional Preserve

The 928-acre Sibley Volcanic Regional Preserve, originally called Round Top Park, was one of EBRPD's original parks (EBRPD 2023c). The preserve provides a self-guided tour of round-top volcanoes (the Volcanic Trail); other trails for hiking, biking, and horseback riding, including the Bay Area Ridge Trail/Skyline National Trail; restrooms, drinking water, and parking facilities; and a backpack campground. The Sibley Backpack Campground has two walk-in (0.2 mile) primitive campsites for a maximum of 15 campers, along with two tent pads, two picnic tables, and a pit toilet (EBRPD 2023d). An unstaffed visitor center at the Skyline Boulevard parking area has displays illustrating the preserve's geology. Cattle grazing occurs in areas of the preserve.

In 2018, EBRPD amended its Sibley Volcanic Preserve Land Use Plan and certified the Final EIR for incorporating adjacent open spaces into Sibley Volcanic Regional Preserve (EBRPD 2018). The amendment includes, in the McCosker planning subarea, restoration of Alder Creek and Leatherwood Creek, which was completed in 2023; expansion of existing staging (parking) areas; improvements to existing roadways and utilities; construction of three vehicle bridges over Alder Creek; expansion of the trail system; and development of a combined group camping/interpretive destination site for up to 50 people with restrooms, interpretive and picnic facilities, parking, and operations facilities. The group camp and some proposed trails are near the alignment of the power lines. The location of the planned group camp, known as Fiddleneck Field, is a potential staging area and helicopter landing zone for construction.

EBRPD Huckleberry Botanic Regional Preserve

The 241-acre Huckleberry Botanic Regional Preserve was established to protect a native plant community that is only found in a few locations along California's coast (EBRPD 2023b). Refer to Section 5.4, Biological Resources, for information on vegetation present in the preserve. The preserve includes a 1.7-mile interpretive loop hiking trail as well as restrooms, parking, and picnic facilities. The Upper Pinehurst Trail, the Lower Pinehurst Trail, and the East Bay Skyline National Recreation Trail (Skyline National Trail) pass through the preserve. The 31-mile Skyline National Trail, overlain with segments of the Bay Area Ridge Trail and the Juan Bautista de Anza Trail, connects the preserve to the regional trail network (EBRPD 2018). Dogs, bicycles, and horses are prohibited in the preserve except for dogs and horses that are allowed on the Skyline National Trail (EBRPD 2023b). The power lines pass over the easternmost segment of the interpretive trail. Refer to Section 5.4 for discussion of biological resources.

The Hills Swim & Tennis Club

The Hills Swim & Tennis Club is a private club in Oakland with pools, tennis courts, and other facilities. The club's northernmost parking lot along Manzanita Drive is a potential staging area. The northern end of the parking lot is adjacent PG&E property where structures EN10 and ES11 are located.

City of Oakland Shepherd Canyon Park

Shepherd Canyon Park is a region-serving public park located just east of SR 13 that extends for approximately one-half mile along Shephard Creek. The 34-acre park contains hiking trails, sports fields, a picnic area, and a playground (Oakland Parks and Recreation Foundation 2024). The MRRT passes through the park. The sports fields sit atop what used to be the middle portion of the natural channel of Shephard Creek, which is part of the Sausal Creek watershed. The proposed project alignment runs through a portion of the western edge of the park. Construction staging and a potential helicopter landing zone will be located on the park's sports fields.

Montclair Railroad Trail

The 1.5-mile paved multi-use MRRT extends from the northern end of Shepherd Canyon Park south and east to Montclair Village (Friends of MRRT 2023). The trail is in the old right-of-way of the Sacramento Northern Railroad, which passed through Montclair Village and Shepherd Canyon on the way to Chico and Sacramento. Several informal trails to the east of the MRRT connect to the local community. Construction staging is planned to occur at various locations along and within the trail.

Montera Middle School

Montera Middle School, part of the Oakland Unified School District (OUSD), is located on 19 acres just east of SR 13 where the project alignment crosses the highway. Approximately 616 students are enrolled (Public School Review 2023). Playground facilities at the school include a track and baseball field, basketball courts, and a concrete "field" (OUSD 2023a), which is a potential staging area. Access to structures EN23 and ES25 and the potential staging area connects through the school parking lot off Scout Road.

Joaquin Miller Elementary School

Joaquin Miller Elementary School, part of the OUSD, is adjacent to Montera Middle School. Approximately 430 students are enrolled (OUSD 2023b). The elementary school's northwestern concrete playground shares a fence with Monera Middle School's concrete "field" where the potential staging area for the project is located.

Montclair Golf Course

Montclair Golf Enterprise's golf course is in Dimond Canyon Park, just west of SR 13 where the project alignment crosses the highway. It is a private 9-hole "pitch-and-putt" style golf course (VisitOakland.com 2023). The parking lot is a potential staging area.

City of Oakland Dimond Park/Dimond Canyon

Dimond Park/Dimond Canyon is a linear region-serving public park extending from SR 13 south approximately 1.2 miles along Sausal Creek. Hiking trails extend the length of Dimond Canyon. Additional park facilities are located in the 12-acre Dimond Park at the south end of Dimond Canyon and include a recreation center, basketball courts, tennis courts, a swimming pool, playgrounds, barbeques, picnic tables, and restroom facilities (Oakland Parks and Recreation Foundation 2024). The existing power lines run through the northern portion of the park and cross several recreational trails.

Corpus Christi School

Corpus Christi School, a private Roman Catholic school serving kindergarten through 8th grade, is directly southwest of the intersection of Park Boulevard and Estates Drive in Oakland (Corpus Christi School 2023). Basketball courts are on a portion of the school's parking lot, and a fenced playground is located adjacent to the driveway off Estates Drive. The parking lot will be used for a tension pull site during construction.

Edna Brewer Middle School

Edna Brewer Middle School, part of OUSD, is located approximately 50 feet from the edge of Park Boulevard where the underground portion of the project is proposed. The school grounds include hard-surface playing fields.

Additional Parks and Recreational Facilities

Parks and recreational facilities, including playgrounds at public schools, that are within 0.5 mile of the project area but do not intersect it include the following and are shown on Figure 5.16-1.

- Moraga Country Club Golf Course (Moraga), a private club where several holes of the course within 0.5 mile of Moraga Substation
- Del Rey Elementary School (Orinda), which has outdoor recreation facilities including softball fields within 0.5 mile of Moraga Substation
- Claremont Canyon Regional Preserve (Oakland/EBRPD), which has a small area within 0.5 mile of the staging areas and access near SR 24
- Grizzly Peak Open Space (Oakland), an open space without trails within 0.5 mile of the staging areas and project access near SR 24
- Reinhardt Redwood Regional Park (Oakland/EBRPD), a1,833-acre park with coast redwoods, other evergreens, chaparral, and grasslands with multiuse trails, picnic areas, play areas, archery, camping,

and connections to regional trails to EBRPD Huckleberry Botanic Regional Preserve and Sibley Volcanic Regional Preserve; only a small area of the northernmost portion of the park is within 0.5 mile of the power line alignment near Skyline Boulevard

- Montclair Park (Oakland), a 7-acre park with a recreation center and outdoor facilities including a pond, three play areas, a skate ramp, picnic areas, a ball field, basketball courts, pickleball and tennis courts, and a ball field within 0.5 mile of the power lines near SR 13
- Beaconsfield Canyon (Oakland), a 5.5-acre open space with informal trails within 0.5 mile of the power line alignment near Shepherd Canyon Park
- Marjorie Saunders Park (Oakland), a small open space near the potential staging area at Montera Middle School
- Joaquin Miller Park (Oakland), a 500-acre park with redwood and oak woodlands, creeks, trails, an off-leash dog area, and other facilities; only a small area of the westernmost portion of the park is within 0.5 mile of the power line alignment near SR 13
- Head Royce Elementary and Highschool (Oakland), which has a pool, tennis courts, and sports fields and is within 0.5 mile of a potential staging area along Lincoln Boulevard
- Hampton Park and Piedmont Sports Field (Piedmont), with facilities for soccer, baseball, tennis, children's football, basketball, volleyball, and a playground within 0.5 mile of the power lines
- Crocker Park (Piedmont), a 1-acre park with a lawn area, flower beds and an art sculpture within 0.5 mile of the power lines
- Glenview Elementary School (Oakland), which has outdoor playing surfaces within 0.5 mile of the power lines
- Crocker Highlands Elementary School (Oakland), which has outdoor playing surfaces within 0.5 mile of the power lines
- Oakland High School (Oakland), which has outdoor recreation facilities including football field within 0.5 mile of Oakland X Substation
- Bella Vista Park (Oakland), a 1.6-acre park with three play areas, basketball hoops, picnic tables, benches, a community garden, and a community artwork area within 0.5 mile of Oakland X Substation

5.16.2 Regulatory Setting

5.16.2.1 Regulatory Setting

No federal or state regulations related to recreational resources are applicable to the project.

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process. No local regulations related to recreational resources are applicable to the project.

5.16.3 Impact Questions

5.16.3.1 Impact Questions

The project's potential effects on recreational resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.16-1 and discussed in more detail in Section 5.16.4.

Table 5.16-1. 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 which might have an adverse physical effect on the environment?	☐	☐	☐	☒

5.16.3.2 Additional CEQA Impact Questions:

The project's potential effects on recreational resources also were evaluated using the CPUC's Additional CEQA Impact Questions for Recreation in the Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing, and Proponent's Environmental Assessments (CPUC 2019). These additional impact questions are evaluated using the significance criteria set forth in CPUC's CEQA Guidelines. The conclusions are summarized in Table 5.16-2 and discussed in more detail in Section 5.16.4.

Table 5.16-2. Additional CEQA Impact Questions for Recreation

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Reduce or prevent access to a designated recreation facility or area?	☐	☐	☒	☐
b) Substantially change the character of a recreational area by reducing the scenic, biological, cultural, geologic, or other important characteristics that contribute to the value of recreational facilities or areas?	☐	☐	☒	☐
c) Damage recreational trails or facilities?	☐	☐	☒	☐

5.16.4 Potential Impact Analysis

Project impacts related to recreational resources were evaluated against the CEQA significance criteria and are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.16.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on recreation were evaluated for each of the criteria listed in Table 5.16-2, as discussed in Section 5.16.4.

5.16.4.2 Applicant-Proposed Measures

The following APM is provided for the project:

APM REC-1: Coordination with Park and Open Space Management and Signage. PG&E will coordinate closely with park and open space landowners for temporary public land closures during project construction activities. If traditional access is temporarily unavailable, signs advising recreational facility users of construction activities, including directions to alternative trails and/or bikeways, will be posted at entrance gates to park and open space areas. Signage will be posted at least 1 week in advance of the construction activity near a park or open space area.

5.16.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? *No Impact.*

Increases in overall permanent demand for recreational facilities typically are associated with substantial increases in population, either by the construction of new residences or by the creation of a major job generator that will indirectly increase the number of residents in an area. Implementation of the project will not construct new residences or create a major job generator. It will not result in a substantial increased demand for recreational facilities or adversely affect the existing recreational resources in a permanent manner. Construction workers may use local parks and recreational facilities, but most workers are anticipated to live in the area and already use these facilities. Workers who do not live in the area may use nearby park facilities during project construction, but any increase associated with such use will be negligible and temporary and will not contribute substantially to the physical deterioration of existing facilities. Project operation and maintenance will be conducted with existing staffing. Therefore, no impact will occur.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? *No Impact*.

The project will not include recreational facilities or require the construction or expansion of recreational facilities. Therefore, no impact will occur.

Additional CEQA Impact Questions

a) Would the project reduce or prevent access to a designated recreation facility or area? *Less-than-Significant Impact.*

Construction work areas and access are in several parks and recreation facilities, including Sibley Volcanic Regional Preserve, Shepherd Canyon Park, Dimond Canyon, MRRT, Montclair Golf Course, and several school playgrounds.

Construction access and staging will occur in several areas in Sibley Volcanic Regional Preserve. These areas represent a very small portion of the hundreds of acres and facilities available throughout the preserve and will not prevent use of the remainder of the preserve. One landing zone/staging area will be located on the site for the planned group camping area/interpretive destination site and will prevent its use for a short period. However, the construction use will be short term, approximately a few weeks at any given site and approximately four months in Sibley Volcanic Regional Preserve, and the area will be restored as needed following construction.

One of the two parking lots at the private The Hills Swim & Tennis Club will be used for construction staging. During construction, access to the private swim and tennis will not be impacted. The construction use will be short term and will not affect use of the club after construction.

Construction access and the work areas for structures EN29, ES21, RN18, RS18, EN20, ES22, EN21, ES23, RN19, and RS19 will use MRRT, which is the major trail through Shepherd Canyon Park. Improvements to the trail may be required, including tree trimming or removal and minor civil work to stabilize banks where equipment will operate during construction. During construction, portions of the trail will be blocked by equipment; signs, flaggers, and other safety measures will be implemented per APM REC-1 so that the trail can continue to be used safely. If it is necessary to block the entire width of the trail, trail users will still be able to use shorter portions of the trail. These impacts will be temporary. The improvements will not reduce or prevent access to the trail following construction. As needed, disturbed areas of the trail will be restored following construction; improvements left in place will not reduce or prevent access to the trail.

The recreation fields at Shepherd Canyon Park will be used for construction staging and may not be useable for recreation during that time. However, the construction use will be short term and other parks in the area provide similar facilities.

The entrance road and parking lot at the private Montclair Golf Course will be used for construction access and staging. During construction, access to the private golf course will not be available. However, the construction use will be short term and will not affect use of the golf course after construction.

The Bridgeview Trail, the Dimond Canyon Trail, and the Old Cañon Trail in Dimond Canyon will be near construction work areas and access for structures EN25, ES27, RN23, RS23, EN26, ES28, RN24, RS24, EN27, ES29, RN25, and RS25. During construction, portions of the trails will be temporarily closed for public safety during adjacent construction activities or when reconductoring activities are occurring that cross overhead. Signs, flaggers, and other safety measures will be implemented per APM REC-1 so that portions of the trails or alternatives trails can continue to be used safely. If it is necessary to block the entire width of the trail, trail users will still be able to use shorter portions of the trail. These impacts will be temporary.

Parking lots and hard-surface playing fields will be used for construction access and staging at Montera Middle School, Corpus Christi School, and Edna Brewer Middle School. The facilities will not be available for recreational use while construction is underway. However, the construction use is short term and these areas will be used for construction when the schools are not in session.

Although construction activities will reduce or prevent access to several parks and recreation facilities as described previously, construction activities are temporary and will last no more than a few weeks at a specific park location. Multiple parks and recreation facilities are available nearby in Contra Costa County, Orinda, Oakland, and Piedmont that can be used for these short periods. Analysis of visual and noise impacts to recreational users resulting from construction of the project is provided in Section 5.1, Aesthetics, and Section 5.13, Noise, respectively. Construction activities will not affect access to the parks and recreation facilities following construction. Operation and maintenance activities in the park and open space areas will be the same as current activities and no change in access to recreation during operations will occur. Impacts to parks and recreation facilities will be less than significant.

b) Would the project substantially change the character of a recreational area by reducing the scenic, biological, cultural, geologic, or other important characteristics that contribute to the value of recreational facilities or areas? *Less-than-Significant Impact*.

As discussed in the previous subsection, construction access and staging will result in temporary and less-than-significant reductions in access to several parks and recreation facilities. In some areas of Sibley Volcanic Regional Preserve, Shepherd Canyon Park, Dimond Canyon, and MRRT, construction will require trimming or removal of trees and vegetation. However, the amount of vegetation removed or modified will be small and the natural landscape characteristics of these parks will be maintained. Refer to Section 5.2, Agriculture and Forestry Resources, and Section 5.4, Biological Resources, for additional information on vegetation removal. Construction impacts will be less than significant. Operation and maintenance activities in the park and open space areas will be the same as current activities and no change in the character of recreational areas will occur.

c) Would the project damage recreational trails or facilities? *Less-than-Significant Impact*.

As discussed previously, construction access and staging will result in temporary and less-than-significant reductions in access during construction to the MMRT and the Old Cañon Trail in Dimond Canyon. Operation and maintenance activities in these areas will be the same as current activities and no change in access to trails during operations will occur.

5.17 Transportation

This section describes existing conditions and potential impacts on transportation from construction, operation, and maintenance of the project. The analysis concludes that, although traffic conditions will be temporarily affected by project construction, project-related impacts to transportation will be less than significant. APMs, as described in Section 5.17.4.2, will further minimize potential less-than-significant impacts.

The project's potential effects on transportation and traffic were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. Project description information and potential impacts are organized and discussed based on the impact questions. Detailed project descriptions are discussed in Chapter 3, Project Description. The conclusions are summarized in Table 5.17-2 (located in Section 5.17.3) and discussed in more detail in Section 5.17.4.

5.17.1 Methodology and Environmental Setting

This section describes the roadways used by workers, equipment, materials, and deliveries during O&M or construction. Access routes will vary depending on the origin of the worker or truck and the type of activity that day. The project will use the existing network of paved and unpaved public and private roads to access structure work areas, pull/tension sites, and laydown areas. Figure 5.17-1 shows existing roads planned for project use. While not specifically highlighted on Figure 5.17-1, the broader network of paved roads leading to project access roads or work areas also will be used during construction. The roads that are most likely to be affected are described.

Traffic data and other transportation system information were obtained from maps, literature searches, and aerial photographs. Annual average daily traffic (AADT) volumes for 2021 for state facilities in the study area were obtained from the Caltrans website (Caltrans 2021). Transit data were obtained from the Alameda-Contra Costa Transit District (AC Transit) website (AC Transit 2024).

5.17.1.1 Circulation System

The regional and local circulation system in the project area consists of two-lane local roadways, city arterials, state routes (SR 13 and SR 24), and one interstate highway (Interstate (I-) 580).

AC Transit is the public transit agency that serves Alameda County and western portions of Contra Costa County. AC Transit has a number of bus routes and stops within 1,000 feet of the project. The City of Oakland and the City of Piedmont have existing pedestrian and bicycle facilities and proposed bicycle facilities along roads within 1,000 feet of the project. The City of Orinda had proposed bicycle facilities along roads within 1,000 feet of Moraga Substation.

5.17.1.2 Existing Roadways and Circulation

Figure 5.17-1 presents the roadways that will be affected by the project, highlighting the major roadways. The proposed project will be in the City of Orinda, in unincorporated areas of Contra Costa County, and in the cities of Oakland and Piedmont within Alameda County. The project starts in the north in the City of Orinda at Moraga Substation. The lines progress southwest, cross through hilly open space and park land, then enter a residential area, then continue southwest across Skyline Boulevard and various local streets to SR 13. From SR 13, the lines progress southwest to near Estates Drive. From Estates Drive, the existing overhead lines that cross local streets will be removed and rerouted underground in Park Boulevard to Oakland X Substation near I-580.

I-580 is the only interstate highway close to the project, and SR 13 and SR 24 are the state routes within the project area. Major City of Oakland-maintained arterials within the project area include Skyline Boulevard, Mountain Boulevard, and Park Boulevard. These roadways are described as follows:

- Interstate 580: I-580 is an east-west eight-lane interstate highway in northern California that runs from U.S. Highway 101 in San Rafael to I-5 near Tracy. Oakland X Substation is located approximately 0.1 mile east of I-580 near the Park Boulevard undercrossing.
- State Route 24: SR 24 is an east-west eight-lane freeway that runs from I-580/I-980 interchange in Oakland to I-680 in Walnut Creek. SR 24 will be used to access the staging and helicopter landing zones east of Caldecott Tunnel approximately 2.5 miles east of Moraga Station.
- State Route 13: SR 13 is a north-south four-lane freeway that runs entirely in Alameda County, connecting I-580 in Oakland to I-80/I-580 in Berkeley. The existing overhead power lines to be rebuilt within the existing alignment cross SR 13. SR 13 will be used to access local roads adjacent to the lines during construction, operation, and maintenance.
- Skyline Boulevard: Skyline Boulevard is a two-lane east-west arterial in the City of Oakland. The existing overhead power lines to be rebuilt within the existing alignment cross Skyline Boulevard. Skyline Boulevard will be used to access local roads adjacent to the lines during construction, operation, and maintenance.
- Mountain Boulevard: Mountain Boulevard is a north-south arterial that runs parallel to SR 13. The roadway has two lanes south of SR 13 and four lanes north of SR 13. The existing overhead power lines to be rebuilt within the existing alignment cross Mountain Boulevard. Mountain Boulevard will be used to access local roads adjacent to the lines during construction, operation, and maintenance.
- Park Boulevard: Park Boulevard is a four-lane northeast-southwest arterial street. Park Boulevard is considered a transit street because it connects local destinations to regional transit streets On-street parking is available along most of Park Boulevard. The power lines will transition from overhead to underground near the Estates Drive/Park Boulevard intersection, approximately 0.6 mile south of SR 13. The rebuilt power lines will progress southwest along a new underground alignment through Park Boulevard and end at Oakland X Substation near I-580.

Other roadways within the project area are local streets and some collectors. Table 5.17-1 describes the roadways that will be affected by the project.

Table 5.17-1. Existing Roadways within Project Area

Roadway	Road Type/Jurisdiction	Number of Lanes (2-way)	Traffic Volumes (AADT/Peak Hours)	Closest Project Component
Lost Valley Drive	Local Street/ City of Orinda	2	N/A	Moraga Substation
Valley View Drive	Local Street/ City of Orinda	2	N/A	Moraga Substation
Dolores Way	Local Street/ City of Orinda	2	N/A	Access to workspace
Edgewood Road	Local Street/ City of Orinda	2	N/A	Access to workspace
Wilder Road	Local Street/ City of Orinda	1	N/A	Moraga Substation
Pinehurst Road	Local Street/ Unincorporated Contra Costa County	2	N/A	Proposed overhead power lines

Table 5.17-1. Existing Roadways within Project Area

Roadway	Road Type/Jurisdiction	Number of Lanes (2-way)	Traffic Volumes (AADT/Peak Hours)	Closest Project Component
Manzanita Drive	Local Street/ City of Oakland	2	N/A	Staging area/Work area for rebuilt overhead power line structures
Skyline Boulevard	Arterial/ City of Oakland	2	N/A	Staging area/Work area for rebuilt overhead power line structures
Arrowhead Drive	Local Street/ City of Oakland	2	N/A	Staging area/Work area for rebuilt overhead power line structures
East Circle Drive	Local Street/ City of Oakland	2	N/A	Staging area
Gunn Drive	Local Street/ City of Oakland	2	N/A	Work area for rebuilt overhead power line structures
Saroni Drive	Local Street/ City of Oakland	2	N/A	Staging area/Work area for rebuilt overhead power line structures
Sayre Drive	Local Street/ City of Oakland	2	N/A	Staging area/Work area for rebuilt overhead power line structures
Saroni Court	Local Street/ City of Oakland	2 (narrow roadway)	N/A	Access to work area
Paso Robles Drive	Local Street/ City of Oakland	2	N/A	Rebuilt overhead power line structures
Balboa Drive	Local Street/ City of Oakland	2	N/A	Staging area/Access to work site/ Rebuilt overhead power line structures
West Circle	Local Street/ City of Oakland	2 (narrow roadway)	N/A	Access to work site/Staging area
Shepherd Canyon Road	Local Street/ City of Oakland	2	N/A	Rebuilt overhead power line structures/Access to work area
Drake Drive	Local Street/ City of Oakland	2	N/A	Access to work area
Scout Road	Local Street/ City of Oakland	2	N/A	Rebuilt overhead power line structures/Access to work area
Mountain Boulevard	Arterial/ City of Oakland	South of SR 13 ramps: 2 North of SR 13 ramps: 4	N/A	Staging area/Work area for rebuilt overhead power line structures
SR 13	State Route/ Caltrans	4	63,000[a]	Staging area/Work area for rebuilt overhead power line structures
SR 24	State Route/Caltrans	8	169,000[a]	Staging area/Helicopter landing zone
Old Tunnel Road	Local Street/Unincorporated Alameda County	2 (narrow roadway)	N/A	Staging area/Helicopter landing zone
Fisher Ranch Road	Local Street/Unincorporated Alameda County	2	N/A	Staging area/Helicopter landing zone

Table 5.17-1. Existing Roadways within Project Area

Roadway	Road Type/Jurisdiction	Number of Lanes (2-way)	Traffic Volumes (AADT/Peak Hours)	Closest Project Component
Monterey Boulevard	Local Street/ City of Oakland	2	N/A	Staging area/Access to work site/Work area for rebuilt overhead power line structures
Leimert Boulevard	Local Street/ City of Oakland	2	N/A	Access to work area/Staging area
Estates Drive	Local Street/ City of Piedmont	2	N/A	Transition area to underground power lines/Staging area
St James Drive	Local Street/ City of Piedmont	2	N/A	Staging area
Trestle Glen Road	Collector Street/ City of Piedmont	2	N/A	Staging area
Glendome Circle	Local Street/ City of Oakland	2	N/A	Workspace/Staging area
Glendora Avenue	Local Street/ City of Oakland	2	N/A	Access to work area
Elbert Street	Local Street/ City of Oakland	2	N/A	Access to staging area
Everett Avenue	Local Street/ City of Oakland	2	N/A	Workspace/Staging area
Wellington Street	Local Street/ City of Oakland	2	N/A	Workspace/Staging area
Norwood Avenue	Local Street/ City of Oakland	2	N/A	Workspace
Creed Road	Local Street/ City of Oakland	2	N/A	Workspace
Holman Road	Local Street/ City of Oakland	2	N/A	Workspace/Staging area
Bates Road	Local Street/ City of Oakland	2	N/A	Workspace/Staging area
Grosvenor Place	Local Street/ City of Oakland	2	N/A	Oakland X Substation/Workspace
Park Boulevard	Arterial/ City of Oakland	4	WB: 1,030/680[b] EB: 570/770[b]	Power lines rebuilt underground
Park Boulevard Way	Local Street/ City of Oakland	2	N/A	Power lines rebuilt underground/Oakland X Substation
I-580	Interstate Highway/ Caltrans	8	177,000[a]	Oakland X Substation

[a] 2021 annual average daily traffic. Source: https://dot.ca.gov/programs/traffic-operations/census

[b] 2017 average AM/PM peak hour volume along Park Boulevard between Alma Place/Grosvenor Place/Excelsior Avenue and Trafalgar Place/ Monterey Boulevard. Source: Park Boulevard – Traffic Operation Analysis, Fehr & Peers, 2017.

N/A: Not Applicable/no available data

5.17.1.3 Transit and Rail Services

Figure 5.17-2 presents the existing transit services within 0.5 mile of the project area. AC Transit is a public transit agency serving Alameda County and the western portion of Contra Costa County. AC Transit is the main transit provider in the cities of Oakland and Piedmont. All transit services provided by

AC Transit within 0.5 mile of the project are bus services. County Connection provides bus service in central Contra Costa County; the nearest bus route in Orinda is approximately 0.5 mile from Moraga Substation. Bay Area Rapid Transit (BART) is the main rail service provider in the region. There are no rail services close to the project area. The closest rail service is the BART Yellow Line (Antioch-SFO), more than 2 miles from the project.

AC Transit operates Transbay Bus Services between local East Bay neighborhoods and the Salesforce Transit Center in San Francisco. Transbay Bus Line V runs between Salesforce Transit Center Bay 25 and California College of the Arts via I-580, Park Boulevard, Moraga Avenue, and Broadway Terrace. Line V passes through Park Boulevard in the project's western section where the underground lines are proposed and turns onto Mountain Boulevard about 0.1 mile from where the overhead power lines are proposed to be rebuilt. Line V runs during commute hours, with an approximate service frequency of every 15 to 60 minutes.

AC Transit operates Line 33 between Mountain Boulevard/Moraga Avenue in Piedmont and Montclair via Highland Avenue, Oakland Avenue, Harrison Street, Kaiser Center, Downtown Oakland, and Park Boulevard. As with Line V, Line 33 passes through Park Boulevard in the western section of the project where the underground lines are proposed and turns onto Mountain Boulevard approximately 0.1 mile away from where the overhead power lines are proposed to be rebuilt. Line 33 runs every day from 5:00 a.m. to 12:00 a.m. with an approximate service frequency of 15 to 30 minutes. Lines V and 33 have stops within 0.5 mile of the project along Park Boulevard at Leimert Boulevard, Hollywood Avenue, Dolores Avenue, Everette Avenue, Wellington Street, Glenfield Avenue, Glen Park Road, Greenwood Avenue, East 38th Street, Kingsley Street, and Chatham Road, and on Mountain Boulevard at Snake Road.

AC Transit operates Line NX, a Transbay Bus Service that runs between Millbrae Avenue/MacArthur Boulevard and Salesforce Transit Center in San Francisco via MacArthur Boulevard, Chatham Road, and I-580. Line NX passes through Chatham Road near Park Boulevard, undercrossing I-580 close to Oakland X Substation. Line NX runs during commute hours, with an approximate service frequency of every 10 to 60 minutes. Line NX's stop at Chatham Road/Park Boulevard is approximately 500 feet from Oakland X Substation.

AC Transit operates Line NL, a Transbay Bus Service that runs between Eastmont Transit Center and Salesforce Transit Center in San Francisco via MacArthur Boulevard, Grand Avenue, downtown Oakland, and West Grand Avenue. As with Line NX, Line NL passes through Chatham Road near Park Boulevard, undercrossing I-580 close to Oakland X Substation. Line NL runs during commute hours, with an approximate service frequency of every 15 to 30 minutes. Line NL has the same stops as Line NX near the project area.

AC Transit operates Line 642, a supplementary service to schools that runs between Montera Middle School north of SR 13 and Snake Road/Colton Boulevard in Oakland via Snake Road, Colton Boulevard, Saroni Drive, and Colton Boulevard. Line 642 passes through Mountain Boulevard north of SR 13 where the overhead power lines are proposed to be rebuilt. The line operates Monday through Friday except holidays. Line 642 has stops within 0.5 mile of the project at Ascot Drive/Scout Road, Ascot Drive/Camino Lenada, Snake Road/Mountain Boulevard, Snake Road/Shepherd Canyon Road, 5798 Snake Road, Snake Road/Magellan Drive, Snake Road/Zinn Drive, Snake Road/Gaspar Drive, Snake Road/Drake Drive, Snake Road/Colton Boulevard, Colton Boulevard/Heartwood Drive, Colton Boulevard/Chambers Drive, Colton Boulevard/Hemlock Lane, Colton Boulevard/Ridgewood Drive, Arrowhead Drive/Homewood Drive, Arrowhead Drive/Glencourt Drive, and Glencourt Drive/Homeglen Lane.

AC Transit operates Line 57 between the Public Market in Emeryville and Foothill Square in Oakland via Shellmound Street, 40th Street and MacArthur Boulevard. It runs through Chatham Road and MacArthur Boulevard near I-580 and Park Boulevard undercrossing close to Oakland X Substation. Line 57 runs daily from about 5:00 a.m. to midnight with an approximate service frequency of 15 minutes. Line 57 has stops within 0.5 mile of the project along Chatham Road at Bruce Street, 13th Avenue, and Park Boulevard.

AC Transit operates Line 805 between Uptown Oakland and Oakland Airport via Grand Avenue, MacArthur Boulevard, and Coliseum BART. As with Line 57, Line 805 runs through Chatham Road and MacArthur Boulevard near I-580 and Park Boulevard, undercrossing close to Oakland X Substation. Line 805 is an all-nighter that runs from midnight to the morning peak period with an approximate service frequency of one hour. Line 805 has the same stops as Line 57 near the project area.

County Connection operates Local Route 6, with service between the Orinda BART station and the Lafayette BART station via Moraga Way and Moraga Road. Local Route 6 runs daily from about 6 a.m. to 8 p.m. on weekdays with an approximate service frequency of 30 minutes and about 9:30 a.m. to 5:30 p.m. on weekends with an approximate service frequency of 80 minutes (County Connection 2024). The nearest stop to the project is at the intersection of Moraga Way and El Camino Moraga.

5.17.1.4 Bicycle Facilities

Figure 5.17-3 presents existing and proposed bicycle lanes, routes, and paths within approximately 1,000 feet of the project and extending into the project vicinity.

The *City of Oakland General Plan* includes the *2019 Oakland Bike Plan*, which describes the existing and recommended (proposed) bikeways or bicycle facilities in the City of Oakland (City of Oakland 2017). The *2019 Oakland Bike Plan* defines bicycle facility types as follows (City of Oakland 2019):

- Shared Use Path: Paths shared by people walking and biking completely separated from motor vehicle traffic. Oakland refers to this as a Class 1 Bikeway.
- Protected Bike Lane: On-street bike lane separated from motor vehicle traffic by curb, median, planters, parking, or other types of physical barrier. Oakland refers to this as a Class 4 Bikeway.
- Buffered Bicycle Lane: Dedicated lane for bicycle travel separated from traffic by a painted buffer. Oakland refers to this as Class 2B Bikeway.
- Bike Lane: Dedicated lane for bicycle travel adjacent to traffic. Oakland refers to this as a Class 2 Bikeway.
- Neighborhood Bike Route: Calm local streets where bicyclists have priority but share roadway space with automobiles. Oakland refers to this as Class 3B Bikeway.
- Bike Route: Signed bike route, sharing the roadway with motor vehicles. Oakland refers to this as a Class 2 Bikeway.

Existing bicycle networks in the City of Oakland within 1,000 feet of the project area are as follows:

- Neighborhood bike route on Excelsior Avenue between Park Boulevard and Ardley Avenue
- Bike route on Monterey Boulevard between Park Boulevard and Redwood Road
- Bike path on Shepherd Canyon Road between Saroni Drive and Lucas Avenue
- Bike route on Skyline Boulevard between Snake Road and Joaquin Miller Park
- Buffered bike lane on Beaumont Avenue between Park Boulevard and Excelsior Avenue
- Neighborhood bike route on Kingsley Street between Park Boulevard and Excelsior Avenue
- Neighborhood bike route on Excelsior Avenue between Kingsley Street and Ardley Avenue

Recommended bicycle networks in the City of Oakland within 1,000 feet of the project area are:

- Bike lane on Park Boulevard between Leimert Boulevard and Grosvenor Place
- Bike path on Park Boulevard between Mountain Boulevard and Leimert Boulevard
- Neighborhood bike route on Leimert Boulevard between Park Boulevard and Redwood Road
- Neighborhood bike route on Mountain Boulevard between Park Boulevard and Moraga Avenue
- Neighborhood bike route on Holman Road between Grosvenor Place and Lakeshore Avenue

The *City of Piedmont General Plan* describes the existing bikeways within the City limits. All Piedmont bikeways in the southeast side of the City are identified as Class III. Class III bikeways are defined by the City of Piedmont as bike routes that operate within moving traffic lanes and are distinguished only by signs or pavement markings. There is a Class III bikeway on St James Drive between Park Boulevard and Hampton Road (City of Piedmont 2011).

In the City of Orinda, a Class II bike lane along Moraga Way is within approximately 3,000 feet of the project area (City of Orinda 2011). The City of Orinda had proposed bicycle facilities along roads within 1,000 feet of Moraga Substation.

5.17.1.5 Pedestrian Facilities

Figure 5.17-4 presents existing pedestrian facilities in the project area. The City of Oakland maintains sidewalks along major roadways within the project area, including Park Boulevard and Mountain Boulevard. South of SR 13, most of the local streets have sidewalks within the project area, including local streets in the City of Piedmont. North of SR 13, most local streets in the City of Oakland and City of Orinda do not have sidewalks within the project area. The main hiking trails within the project area are Montclair Railroad Trail, Sausal Creek Trail, and trails within Huckleberry Botanical Regional Preserve and Sibley Volcanic Regional Preserve, including the East Bay Skyline Trail.

5.17.1.6 Vehicle Miles Traveled

The average 2020 VMT in the study area is estimated to be higher than 25 VMT per capita just north of SR 13, and between 20 and 25 VMT per capita just south of SR 13 (Alameda CTC 2020). VMT per capita is defined as home-based VMT at the residence Transportation Analysis Zone (TAZ) divided by total population in the TAZ. VMT includes all travel within the nine-county Bay Area plus San Joaquin County (the model area) plus estimates of travel distances beyond the ten-county model area (Alameda CTC 2020).

5.17.2 Regulatory Setting

5.17.2.1 Federal

Americans with Disabilities Act Standards for Accessible Design

The proposed project will involve reconstructing sidewalks and trails at station and line locations and will be required to comply with Americans with Disabilities Act (ADA) standards. The U.S. Department of Justice enacted the ADA in 1990, which adopted enforceable accessibility standards for facility design. The revised ADA standards adopted in 2010 set minimum requirements for newly designed and constructed or altered state and local government facilities, public accommodations, and commercial facilities. State and local government facilities must adhere to the following requirements of the 2010 standards:

- Title II regulations at 28 CFR 35.151
- 2004 ADA Accessibility Guidelines at 36 CFR 1191, Appendices B and D

5.17.2.2 State

Caltrans owns the ROW for state facilities, including any on- and off-ramps that provide access to the project area. Any project-related work within state ROW requires an encroachment permit from Caltrans.

Caltrans is also the administering agency for regulations related to traffic safety, including licensing drivers, limiting weights and loads, transporting hazardous and combustible materials, and safely operating vehicles.

Senate Bill 743

In December 2018, the CEQA Guidelines were updated to incorporate Senate Bill 743. As a result, the guidelines (Section 15064.3) shift the focus of a CEQA analysis of transportation impacts away from quantification of automobile delay to focus on VMT to determine significance. VMT refers to the amount and distance of automobile travel attributable to a project, sometimes expressed as an average per trip or per person. Subdivision (b)(3), Qualitative Analysis, recognizes that lead agencies may not be able to quantitatively estimate VMT for every project type and indicates that a qualitative analysis may be appropriate.

California Vehicle Code

Section 21400 of the California Vehicle Code directs Caltrans to adopt rules and regulations prescribing uniform standards and specifications for all official traffic control devices placed pursuant to the vehicle code. The *Work Area Traffic Control Handbook* provides the basic standards for the safe movement of traffic, including motorists, bicyclists, and pedestrians, on streets, highways, and bikeways during highway construction or utility work in accordance with Section 21400 of the California Vehicle Code. The *California Manual on Uniform Traffic Control Devices* provides uniform standards and specifications for all official traffic control devices in California, pursuant to the provisions of Section 21400 of the California Vehicle Code.

5.17.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and certified unified program agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

Alameda County

The *Alameda County General Pla*n was adopted in 2021. The Mobility Element focuses on an equitable, safe, and sustainable transportation network for all county residents. Alameda County's goal is to reduce its greenhouse gas emission dominantly from vehicle trips, by transforming its transportation system to give residents convenient and safe, climate-friendly transportation choices and alternatives to the single-occupant vehicles and reducing VMT (Alameda County 2022). Alameda County complies with the provisions of the CEQA Guidelines. Alameda County does not provide specific CEQA thresholds of significance for transportation.

City of Orinda

The *City of Orinda General Plan* was adopted in 1987. The policies relevant to transportation are in the Land Use and Circulation Element. The Circulation Element includes guiding policies that recommend retaining the existing peak hour level of service (LOS) of C or better at intersections where it prevails and improve the LOS at all other intersections. The City of Orinda complies with the provisions of the CEQA Guidelines. The City of Orinda does not provide specific CEQA thresholds of significance for transportation.

City of Piedmont

The *City of Piedmont General Plan* was adopted in 2009.The Transportation Element focuses on addressing mobility, traffic flow, public transit, walking and bicycling, parking and safety. The Transportation Element supports reducing VMT as a policy provided to achieve mobility and choice goals. The City of Piedmont complies with the provisions of the CEQA Guidelines. The City of Piedmont does not provide specific CEQA thresholds of significance transportation.

City of Oakland General Plan

The *City of Oakland General Plan* was adopted in 1998. The policies relevant to transportation are contained primarily in the Land Use and Transportation Element. Applicable local plans that are incorporated in the City's General Plan include the *City of Oakland Pedestrian Master Plan (Oakland Walks! 2017 Pedestrian Plan Update)* and the *City of Oakland Bicycle Master Plan (2019 Oakland Bike Plan)*.

City of Oakland Transportation Impact Review Guidelines

The *City of Oakland Transportation Impact Review Guidelines* provides guidelines for evaluating the potential transportation impact of proposed projects, both for CEQA compliance and to address their planning and engineering requirements.

Transportation Analysis (for Built Projects)

At the City of Oakland's discretion, operations analysis may be recommended at some development projects that generate more than 800 peak hour vehicle trips or 400 peak hour transit trips (for planning purposes only; no cumulative year analysis is required).

Construction

The City of Oakland advises that every reasonable effort should be made to avoid and minimize construction impacts on pedestrian, bicycle, and bus facilities in the City through the development of traffic control plans. Proposed truck routes and operating hours should be indicated within the plans. For large projects, the staging plans of construction trucks for materials delivery should be cited, and methods for addressing the parking needs of construction workers and displaced employees (if they will remain nearby onsite) should be identified.

The plans will identify proposed closures of sidewalks, parking lanes, bikeways, travel lanes, street segments, and all other rights-of-way, including the extent and duration of the closure. Potential impacts will be evaluated on pedestrian circulation, traffic operations (including vehicles, transit, and bicycles), and loading, in accordance with the City of Oakland's Supplemental Design Guidance. The need to remove or relocate transit stops will be noted. Long-term sidewalk detours are not acceptable in downtown Oakland, nor in areas where significant pedestrian activity occurs, such as near BART stations and in neighborhood commercial areas. Only in areas where there is little existing pedestrian volume should a long-term sidewalk detour be proposed. If the number of construction truck trips anticipated for the project will deteriorate the pavement, repair or replacement of the paving may be necessary and can be prescribed as a condition of approval.

Oakland CEQA Thresholds of Significance

The City of Oakland's CEQA Thresholds of Significance require an evaluation of potential impacts related to VMT criteria. The project would have a significant effect on the environment (City of Oakland 2017) if it would:

- Conflict with a plan, ordinance, or policy addressing the safety or performance of the circulation system, including transit, roadways, bicycle lanes, and pedestrian paths (except for automobile LOS or other measures of vehicle delay).
- Cause substantial additional VMT per capita, per service population, or other appropriate efficiency measure.
- Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow lanes) or by adding new roadways to the network.

The following are thresholds of significance (City of Oakland 2017) related to substantial additional VMT:

- For residential projects, a project would cause substantial additional VMT if it exceeds existing regional household VMT per capita minus 15 percent.
- For office projects, a project would cause substantial additional VMT if it exceeds the existing regional VMT per employee minus 15 percent.
- For retail projects, a project would cause substantial additional VMT if it exceeds the existing regional VMT per employee minus 15 percent.

In addition, the City of Oakland defines VMT screening criteria for when a project does not exceed VMT thresholds of significance (City of Oakland 2017). If a project or components of the project meet any of the following screening criteria, then it is presumed VMT impacts would be less than significant for the project or component of the project and a detailed VMT analysis is not required. There are three key screening criteria, as follows:

- Presumption of less-than-significant impact for small projects: Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, projects that generate fewer than 100 vehicle trips per day may be assumed to cause a less-than-significant transportation impact
- Presumption of less-than-significant impact for residential, retail, and/or office projects in low-VMT areas
- Presumption of less-than-significant impact near stations within 0.5 mile of an existing major transit stop or an existing stop along a high-quality transit corridor

City of Oakland Complete Streets Policy

The City of Oakland Complete Streets policy requires the City to consider an integrated transportation network with the design of infrastructure to be safe, attractive, and convenient for all users, including pedestrians, bicyclists, people with disabilities, seniors, motorists, public transportation users and operators, and any other users of roadways (Oakland City Council 2013).

5.17.3 Impact Questions

5.17.3.1 Impact Questions

The project's potential effects on transportation were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.17-2 and discussed in more detail in Section 5.17.4.

Table 5.17-2. 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 a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

5.17.3.2 Additional CEQA Impact Questions

The project's potential effects on transportation also were evaluated using the CPUC's Additional CEQA Impact Questions for Transportation in the *Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments* (CPUC 2019). These additional impact questions are evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.17-3 and discussed in more detail in Section 5.17.4.

Table 5.17-3. Additional CEQA Impact Questions for Transportation

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations?	☐	☐	☒	☐
b) Interfere with walking or bicycling accessibility?	☐	☐	☒	☐
c) Substantially delay public transit?	☐	☐	☒	☐

5.17.4 Potential Impact Analysis

Project impacts related to transportation were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the O&M phase.

5.17.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "… a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. In accordance with Appendix G of the CEQA Guidelines, the potential significance of project impacts on transportation were evaluated for each of the criteria listed in Tables 5.17-2 and 5.17-3, as discussed in Section 5.17.4.3.

5.17.4.2 Applicant-Proposed Measures

The project will implement the following transportation APMs:

APM TRA-1: PG&E Temporary Traffic Controls. PG&E will obtain any necessary transportation and encroachment permits from Caltrans and the local jurisdictions, as required, including those related to state route crossings and the transport of oversized loads and certain materials, and will comply with permit requirements designed to prevent excessive congestion or traffic hazards during construction. PG&E will develop traffic control plans to detail road and lane closure or width reduction or traffic diversion as required by the encroachment permits. Residents and emergency service providers will be notified of upcoming road closures consistent with the notification procedures described in APM NOI-1. Construction activities that are in, along, or cross local roadways will follow best management practices and local jurisdictional encroachment permit requirements—such as traffic controls in the form of signs, cones, and flaggers—to minimize impacts on traffic and transportation, including emergency vehicle access and evacuation routes in the project area. Where work areas will occupy the end of a street with no secondary access and residential access may be restricted, PG&E will implement residential safe transport. PG&E will provide the CPUC with copies of permits obtained prior to construction activity in each jurisdiction or location. If required for obtaining a local encroachment permit, PG&E will establish a Traffic Management Plan (TMP) to address haul routes, timing of heavy equipment and building material deliveries, workers and equipment parking, potential street or lane closures, signing, lighting, and traffic control device placement. When working on state highways, PG&E will ensure traffic control operations are compliant with both the *California Temporary Traffic Control Handbook*, 2019 edition, and the *California Manual on Uniform Traffic Control Devices*, 2014 edition, and any updated versions of these documents that become available before start of construction.

APM TRA-2: PG&E Repair of Damaged Transportation Infrastructure. Restoration of roads and all removed or damaged curbs, gutters, and sidewalks will be done in compliance with the locally issued ministerial permits. Road restoration is based on matching the roadway's existing subbase and surface (asphalt, concrete, or a combination of both). After backfilling a duct bank trench or vault excavation, a road base backfill or slurry concrete cap will be installed and a pavement surface will be laid where the trench or excavation occurred. The edges of the pavement surface will be leveled to match the existing adjacent pavement surface. If the initial pavement surface is cold patch asphalt, then it will act as a temporary layer to return the road to service per ministerial permit conditions. Temporary cold patch asphalt will be removed before the final road pavement surface is installed. Final pavement surface restoration will use hot mix asphalt, concrete, or a combination of both depending on the ministerial permit conditions. Repaving and striping will be completed sequentially as completed sections of road surface are being restored, and this process will continue until the pavement restoration activity is complete.

5.17.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project O&M will be conducted with existing staffing using existing access.

a) **Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? *Less-than-Significant Impact.***

Construction

Construction of the proposed project is expected to take approximately 35 months (potentially beginning summer of year 2028 and ending summer of year 2031 with vegetation restoration activities continuing through 2032) to complete and will result in a temporary increase in local traffic because of construction-related workforce traffic and equipment and material deliveries. Construction will occur within and across several roadways, which could temporarily disrupt existing transportation and circulation in the project area.

The existing access to the overhead lines will serve as primary construction access. Most work areas will be accessed directly from adjacent paved roads or existing dirt access roads. Some additional access to the ROW may be required for safe access to a construction work area. Where the lines are being rebuilt underground, access off paved roads is not expected. The existing network of roads is expected to be used to access structure work areas, pull and tension sites, and staging areas. Existing public paved roads throughout the area will be used to access the project site. In addition to vehicular access, pedestrian access will occur in several locations. Figure 3.5-1 in Chapter 3, Project Description, shows access roads along the project. In addition, a light-duty helicopter is expected to be used in the eastern section of the project as part of the conductor stringing operation to support construction survey staking; lifting or transporting of structure components; crew transport to towers; and potentially lifting equipment for installation of micropiles. The helicopter flight path generally will follow the power line alignment. The helicopter flight paths also will traverse from airports to landing zones, or from landing zones to structures under construction.

Multiple staging areas are located along the project alignment; refer to Figure 3.5-1. Most of the staging areas will be within approximately 1,000 feet of the work areas. These staging areas will temporarily generate daily construction-related traffic from workers traveling to the staging areas from their residences or from the staging areas to their residences (that is, home to work/work to home trips), and from construction-related trucks destined to/from the staging areas to/from specific work areas. Specific staging area locations will be determined based on areas available at the time of construction.

Construction work areas will be required at each structure along the lines, at the substations, at pull and tension sites, and along the underground portion of the cables. Activities within construction work areas may include vehicle and equipment parking and operation; limited equipment and vehicle maintenance and fueling; material delivery, staging, and removal; and structure-specific activities associated with pull and tension/stringing or conductor removal. In addition, construction work areas will include excavation and installation of duct banks, conduits, and vaults for the underground portion of the cable.

Temporary Closures

Construction activities and work areas for the aboveground power line construction are expected to be within existing power line ROW or franchise. Work within public ROW will be limited to construction activities in, along, or crossing roadways and sidewalks. Temporary guard structures will be installed where construction activities will cross over local roadways, arterials, and state routes to protect vehicles and pedestrians. The following local roadways, arterials, and state highway will be spanned by the temporary guard structures: Manzanita Drive, Skyline Boulevard, Arrowhead Drive, Gunn Drive, Saroni Drive, Sayre Drive, Balboa Drive, Shepherd Canyon Road, Scout Road, Mountain Boulevard, SR 13, Monterey Boulevard, Park Boulevard, Estates Drive, Saint James Drive, Trestle Glen Road, Glendome Circle, Norwood Avenue, and Creed Road. Netting also will be installed where needed, such as at the SR 13 crossing. For pedestrian trails, in open space areas, traffic controls or flaggers may be used in place of physical structures.

Temporary road and lane closures (including rolling stops) are anticipated when certain sections of the PG&E lines are being removed or reconductored at the road overhead crossings. In some locations, road closures may last up to approximately 10 working days (2 calendar weeks) primarily for the crane work activities on surface streets. For the SR 13 crossings, the California Highway Patrol and Caltrans will be contacted to organize 5- to 10-minute rolling stops. Temporary lane closures, including one-way traffic control, also will be required at various locations for public safety. Full closures at several locations along Montclair Railroad Trail will also likely last up to 2 calendar weeks.

For the underground power line construction, temporary short-term closures of one travel lane and one parking lane along Estates Drive, Park Boulevard, and Park Boulevard Way are expected for the placement of the vaults, trenching, and duct bank installation, with one lane remaining open to allow through traffic in each direction. Approximately 100 to 200 feet of trench will be open at any one time depending on the encroachment permitting requirements of the cities of Oakland and Piedmont.

Final lane closure plans will be determined following detailed investigations into existing utilities (for the underground segment) and final construction planning.

Construction Work Hours

Construction typically will occur Monday through Saturday between 7:00 a.m. and 8:00 p.m. or during times that will be set through coordination with relevant jurisdictions and property owners. If work activities or required clearances on the power lines will cause traffic congestion or necessitate work outside of normal working hours, the project may require nighttime work or work on Sundays. These work activities may include conductor stringing activities, conductor splicing, work associated with the underground cable, unanticipated schedule delays, or preparation for inclement weather.

Construction Added Trips

During construction, vehicle trips will be generated by construction workers, equipment deliveries, and material delivery trucks. Transport vehicles (such as crew-cab trucks and pickups) will be used to transport personnel to staging areas, work areas, and pull sites. Construction-related traffic will vary according to the construction phase. A light-duty (Hughes MD 500 or equivalent), medium-duty (407 Long Ranger/Jet or equivalent) and heavy-duty (UH60, Blackhawk) helicopters are expected to be used in the eastern section of the project to support construction survey staking; lifting or transporting of structure components; crew transport to towers; and potentially lifting of equipment for installation of micropiles. Temporary increases in project construction vehicle trip generation will vary based on the construction activity, equipment needs, and other factors. Overall, based on the proposed project's construction phasing and schedule, an average daily vehicular trip generation for each month for the project's construction was provided by PG&E.

The peak workforce is estimated to be up to 117 workers per day during the peak month of construction (October 2027), and average daily workforce will consist of approximately 62 workers. On a typical workday during 2027, up to 8 crews will be performing project activities. The breakdown by construction activity for the typical peak workday is:

- Structure removal and rebuild: 2 crews will be working on various segments
- Substation work: 1 crew will be working at each of Moraga and Oakland X substations to install new equipment
- Trenching work: 2 crews will be working in a linear fashion along the underground line route
- Conductor stringing: 3 crews will be in the field, working at pull and tension sites and using helicopters or drones, depending on location.

It is estimated that construction activities associated with rebuilding and removing structures, construction of the underground lines, substation work, and reconductoring will result in up to 68 trucks per day during the peak month, and an average of 47 trucks per day. Truck traffic will range between light-duty trucks to heavy-diesel truck (dump trucks, haul trucks, flatbed trucks, concrete mixer trucks), depending on the needs of the construction activity. Table 5.17-4 summarizes the peak construction vehicle trip generation for the proposed project.

Table 5.17-4. Peak Construction Trip Generation

Trip Type		No. of Workers or Trucks	ADT	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Workers	Auto/Light Trucks (1.0 PCE)	109	218	109	0	109	0	109	109
	Medium/Heavy Trucks (2.0 PCE)	8	32	16	0	16	0	16	16
Light Trucks (1.0 PCE)		20	40	20	0	20	0	20	20
Medium/Heavy Trucks (2.0 PCE)		47	188	94	0	94	0	94	94
Total Construction Traffic in PCE			478	239	0	239	0	239	239

ADT = average daily traffic
PCE= passenger-car equivalent

As shown in Table 5.17-4, project construction traffic will temporarily increase traffic volumes on local roadways, arterials, and state highways identified in Table 5.17-1. The effects of these volume increases will be short term and periodic. Most construction trips are expected to occur before 7:00 a.m. and after 4:00 p.m. when background traffic volumes are somewhat lower. In addition, not all trips will affect the same roads, as crew members along with the necessary equipment will be working at multiple locations.

Transit Services/Pedestrian Facilities/Bicycle Facilities

The AC Transit bus stops along Park Boulevard, Shepherd Canyon Road, and Arrowhead Drive could be temporarily affected by the project construction due to temporary lane closures. The bikeways on Excelsior Avenue, Monterey Boulevard, Shepherd Canyon Road, Skyline Boulevard, Beaumont Avenue, Kingsley Street, and St. James Drive could be temporarily affected by the project construction due to temporary lane closures. A brief one lane closure is required to install guard structures at locations where construction activities will cross over local roadways and arterials. Work areas may require a one lane or a road closure of up to approximately 10 working days (2 calendar weeks) along some of the roads. Refer to Figure 3.5-1.

Similarly, the sidewalks along Park Boulevard, Mountain Boulevard, local streets south of SR 13, and recreational hiking trails could be temporarily affected by project construction. Full closures at several locations along Montclair Railroad Trail may also be required for up to approximately 10 working days (2 calendar weeks). Sidewalk, trail, and lane closures may detour pedestrians temporarily, but impacts will be short term and temporary.

PG&E will obtain all necessary road permits, including encroachment permits, prior to construction and will comply with all the applicable conditions of approval from the affected agencies or entities. One-way traffic controls and short-term road closures will be implemented as needed to allow for construction activities and to maintain public safety. PG&E will apply for a Traffic Control Plan (APM TRA-1) from the City of Oakland, and any similar permits required by the cities of Piedmont and Orinda. PG&E will use traffic control and other traffic safety measures to maintain proper traffic flow during temporary construction activities, minimizing any effects on traffic. Implementation of APM TRA-2 will restore all removed or damaged curbs, gutters, sidewalks, and paved surfaces, as necessary.

As required by the City of Oakland, PG&E will develop a TMP that will establish methods for minimizing construction effects on roadways, transit services, pedestrian facilities, and bicycle facilities. The TMP will address haul routes, timing of heavy equipment and material deliveries, workers and equipment parking, potential street or lane closures, signing, lighting, and traffic control device placement. When working on state highways, PG&E will plan traffic control operations to be compliant with both the *Work Area Traffic Control Handbook*, 2019 edition, and the *California Manual on Uniform Traffic Control*

Devices, 2014 edition. The TMP will include consultation with AC Transit and any other affected transit agency prior to construction to reduce potential interruption of transit services and alternative walking or bicycling routes when needed to reduce interference with walking and bicycling accessibility.

With the completion of the project, public transit operations will return to preconstruction conditions. The proposed project will have no lasting impact on demand for alternative transportation or on alternative transportation facilities. The project will not conflict or be inconsistent with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Therefore, the impact will be less than significant.

Operations and Maintenance

O&M activities of the system will consist of routine inspection, repair, and maintenance activities. Inspections and routine patrols will be performed in accordance with PG&E's *Transmission Owner Maintenance Practices for Electrical Overhead Transmission Lines*, in the latest revision, as filed with the California Independent System Operator. PG&E inspections typically are performed annually, by either vehicle or helicopter. Routine maintenance will be performed to correct conditions identified during inspections. For overhead lines, the same O&M activities will be used for the rebuilt lines and therefore, no additional traffic generated from operational activities are expected. For underground lines, additional traffic generated from operational activities will be minimal and infrequent. The vehicle trips will be limited to the current PG&E O&M personnel conducting periodic inspections and as-needed maintenance/repair activities. No additional O&M personnel will be required. Any net increase in O&M vehicle trips will be negligible and will be consistent with the threshold in the City of Oakland's Transportation Impact Review Guidelines (City of Oakland 2017).

Proposed PG&E O&M activities will not be expected to require lane or road closures or operation of heavy equipment within public roadways; however, if these activities were to be required (for example, because of a major repair to an underground vault), traffic control will be implemented and adherence to requirements in any encroachment permits will reduce traffic impact. Traffic impacts associated with staging O&M equipment in a lane to make necessary repairs and inspections are typically infrequent and temporary in nature, resulting in less-than-significant impacts on traffic.

PG&E O&M will not conflict or be inconsistent with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Therefore, the impact will be less than significant.

b) Would the project conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)? *Less-than-Significant Impact.*

In December 2018, the California Natural Resources Agency updated the CEQA Guidelines to incorporate Senate Bill (SB) 743. As a result, CEQA Guidelines Section 15064.3 shifts the focus of a CEQA analysis of transportation impacts away from quantification of automobile delay to focus on VMT to determine the significance. VMT refers to the amount and distance of automobile travel attributable to a project.

CEQA Guidelines Section 15064.3, subdivision (b) focuses on specific criteria (VMT) for determining the significance of transportation impacts. It is further divided into four subdivisions: (1) land use projects, (2) transportation projects, (3) qualitative analysis, and (4) methodology. The proposed PG&E project, a power line rebuild/upgrade project that will generate temporary construction-related traffic and an expected net change in O&M traffic, will be categorized under subdivision (b)(3), qualitative analysis, which recognizes that lead agencies may not be able to quantitatively estimate VMT for every project type and indicates that a qualitative analysis of construction traffic may be appropriate. Because the project will generate only temporary construction-related traffic, a qualitative analysis of transportation impacts related to VMT is used.

Construction

Construction of the PG&E project components could result in a temporary increase in local traffic as a result of PG&E construction-related workforce traffic and material deliveries and construction activities occurring within the public ROW. The primary offsite impacts from the movement of construction trucks will include short-term and intermittent effects on traffic operations because of slower movements and larger turning radii of the trucks compared to passenger vehicles. The VMT for the proposed project construction-related vehicle trips will depend on several factors, including the origin of construction worker commute trips (for example, distance from their homes or temporary lodging to the construction site), origin of materials and equipment deliveries to the construction site, and distance to landfills or other disposal sites from the construction site. The construction vehicle trips and associated VMT will be temporary. When construction is completed, construction-related traffic will cease and VMT levels will return to pre-existing conditions. The project will not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). Therefore, the impact will be less than significant.

Operations and Maintenance

PG&E O&M does not propose housing, businesses, or other land use changes that will induce growth in the area. The vehicle trips generated by PG&E O&M will be limited to PG&E personnel conducting periodic inspections and as-needed maintenance/repair activities and will be nominally the same as VMT for O&M on the existing power lines. Any net increase in O&M VMT will be negligible and well below the daily 110 vehicle trips threshold provided in the *2018 Governor's* Office of Planning and Research's Technical Advisory guidelines (Office of Planning and Research, 2018); and the daily 100 vehicle trips threshold in the City of Oakland's Transportation Impact Review Guidelines (City of Oakland 2017).

PG&E O&M will not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). Therefore, the impact will be less than significant.

c) **Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? *Less-than-Significant Impact.***

Construction

Project construction will not alter the road geometry of any public roadways or intersections, including access roads to power lines, towers or poles, and substations, nor will it introduce incompatible uses to the project area. Construction of the PG&E project components will involve heavy equipment operating adjacent to or within a road ROW that could increase the risk of crashes. Construction-generated trucks on project site roadways will interact with other vehicles. Potential conflicts also could occur between construction traffic and bicyclists and pedestrians.

PG&E will obtain all necessary road encroachment permits prior to construction and will comply with all the applicable conditions of approval, including roadside safety protocols, to reduce risk of crashes. PG&E will apply for a Traffic Control Plan (APM TRA-1) from the City of Oakland, and any permits required by the cities of Piedmont and Orinda. PG&E will use traffic controls and other traffic safety measures to maintain proper traffic flow during temporary construction activities, minimizing any effects on traffic. When working on state highways, PG&E will plan traffic control operations to be compliant with both the *California Temporary Traffic Control Handbook*, 2019 edition, and the *California Manual on Uniform Traffic Control Devices*, 2014 edition. The installation of crossing guard structures will further ensure that impacts are avoided. Any road closures that will occur on private or city roads will be temporary and short term, consistent with applicable regulations, and will be coordinated with the City or property owner(s).

With the completion of the project, public transit operation will return to preconstruction conditions. The project will not increase hazards or incompatible uses. Therefore, the impact will be less than significant.

Operations and Maintenance

PG&E O&M will not involve any new permanent design features or propose geometric alteration that could be hazardous or incompatible because, upon completion, the overhead lines and structures will be in a similar configuration and alignment as in the existing condition. Vault covers for the underground portion of the project will be flush with the repaved roadway and are not expected to increase hazards. PG&E O&M will not increase hazards or incompatible uses. Therefore, the impact will be less than significant.

d) Would the project result in inadequate emergency access? *Less-than-Significant Impact.*

Construction

The project will not create transportation-related hazards or result in a substantial negative effect on emergency access. Emergency access will be maintained throughout PG&E's construction. PG&E construction vehicles and equipment are anticipated to access project construction areas by using existing PG&E access and paved roads or existing dirt access roads. Construction vehicles and equipment needed at the pull sites will follow designated access routes and are expected to be parked or staged within the project ROW or alongside existing access roads. Any lane closures will be temporary and short term, and PG&E closures will be coordinated with Caltrans or local jurisdictions to reduce the effects of potential temporary and short-term emergency access. At locations where full road closures may be needed for construction staging and access, emergency responders will be provided options for ingress and egress, maintaining emergency access. Emergency responders will be notified prior to construction; ensuring access for emergency vehicles.

PG&E will obtain all necessary road encroachment permits prior to construction and will comply with all the applicable conditions of approval. PG&E will apply for a Traffic Control Plan (APM TRA-1) from the City of Oakland, and any permits required by the cities of Piedmont and Orinda. PG&E will use traffic controls and other traffic safety measures to maintain proper traffic flow during temporary construction activities, minimizing any effects on traffic and transportation, including emergency vehicle access and evacuation routes.

With the completion of the project, roadway operations will return to preconstruction conditions. The project will not result in inadequate emergency access. Therefore, the impact will be less than significant.

Operations and Maintenance

PG&E O&M will not involve any new permanent design features or propose geometric alteration that could interfere with emergency vehicle access because the overhead lines and structures will be in a similar configuration and alignment as in the existing condition. The O&M activities for the underground portion of the project may require occasional lane closures along Park Boulevard (for example because of a major repair to an underground vault). Such closures will be brief and will maintain emergency access. PG&E O&M will not result in inadequate emergency access. Therefore, the impact will be less than significant.

5.17.4.4 Additional Impact Questions

a) Would the project create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations? *Less-than-Significant Impact.*

Construction

Temporary construction-related lane and sidewalk closures, along with associated traffic and construction site access control, will be used to separate people from potentially hazardous conditions that may be present inside a PG&E construction site work area. PG&E construction vehicles on roadways will be present only temporarily and cause limited-duration changes to walking, bicycling, and driving conditions as the vehicles travel on roads during construction. Temporary closures along roads for work areas will reduce the hazardous risks to pedestrian and vehicles. These roads are Manzanita Drive, Skyline Boulevard, East Circle, Sayre Drive, Saroni Court, Balboa Drive, West Circle, Cortez Court, Scout Road, Monterey Boulevard, Leimert Boulevard, Park Boulevard, St. James Drive, Glendome Circle, Holman Road, Bates Road, and Park Boulevard Way. Impacts to use of recreational trails by people walking or bicycling is discussed in Section 5.16, Recreation, where impacts were determined to be less than significant.

PG&E will obtain all necessary road encroachment permits prior to construction and will comply with all the applicable conditions of approval, including roadside safety protocols to reduce risk of crashes. PG&E will apply for a Traffic Control Plan (APM TRA-1) from the City of Oakland, and any permits required by the cities of Piedmont and Orinda. PG&E will use traffic controls and other traffic safety measures to maintain proper traffic flow during temporary construction activities, minimizing any effects on traffic. When working on state highways, PG&E will ensure traffic control operations are compliant with both the *California Temporary Traffic Control Handbook*, 2019 edition, and the *California Manual on Uniform Traffic Control Devices*, 2014 edition.

With the completion of the project, roadway lanes and sidewalks will return to preconstruction conditions. The project will not create hazardous conditions for people walking, bicycling, or driving or for public transit operations. Therefore, the impact will be less than significant.

Operations and Maintenance

PG&E O&M will not involve any new permanent design features or propose geometric alteration that could be hazardous for people walking, bicycling, or driving or for public transit operations because the overhead lines and structures will be in a similar configuration and alignment as the existing condition. Vault covers for the underground portion of the project will be flush with the repaved roadway and will not present any hazards. PG&E O&M will not create hazardous conditions. Therefore, no impacts will occur.

b) Would the project interfere with walking or bicycling accessibility? *Less-than-Significant Impact.*

Construction

PG&E vehicles and equipment will be operated according to applicable laws and regulations. Temporary interference with walking or bicycling accessibility may occur due to temporary closures of sidewalks and trails. The sidewalks along Park Boulevard, Mountain Boulevard, local streets south of SR 13, and hiking trails may be temporarily closed to pedestrian access during construction. Similarly, the Montclair Railroad Trail will be partially or fully closed to pedestrians on a temporary basis, as discussed in Section 5.16, Recreation.

The bicycle lanes, routes, and paths along Excelsior Avenue, Monterey Boulevard, Shepherd Canyon Road, Skyline Boulevard, Beaumont Avenue, Kingsley Street, and St. James Drive may be temporarily closed because of construction activities in or adjacent to the roadways. Proposed bikeways exist within approximately 1,000 feet of the PG&E project components along Leimert Boulevard, Holman Road, and Mountain Boulevard and along the underground alignment on Park Boulevard. Similarly, the Montclair Railroad Trail will be partially or fully closed to bicycles on a temporary basis.

PG&E will obtain all necessary road permits, including encroachment permits, prior to construction and will comply with all the applicable conditions of approval. PG&E will apply for a Traffic Control Plan from the City of Oakland, and any permits required by the cities of Piedmont and Orinda. As required by the City of Oakland, a TMP will establish methods for minimizing construction effects on walking and bicycling accessibility. The TMP may propose an alternative walking or bicycling route when needed to reduce interference with walking and bicycling accessibility. With the completion of the project, walking and bicycling accessibility will return to preconstruction conditions. With these measures, the project will not increase hazards or incompatible uses. Therefore, the impact will be less than significant.

Operations and Maintenance

PG&E O&M will not interfere with walking and bicycling accessibility because, upon completion, the overhead lines and structures will be in a similar configuration and alignment as the existing condition. Vault covers for the underground portion of the project will be flush with the repaved roadway and will not present any hazards to bicyclists. Sidewalks affected by construction will be repaired or replaced. PG&E O&M will not affect accessibility to walking and bicycling. Therefore, no impacts will occur.

c) Would the project substantially delay public transit? *Less-than-Significant Impact.*

Construction

Project construction areas are located within approximately 1,000 feet of public transit facilities. The operation of AC Transit's lines V and 33 and their stops along Park Boulevard will be temporarily affected by construction activities for the underground segment of the project. The operation of AC Transit's line 642 and its stops along Snake Road, Shepherd Canyon Road, and Arrowhead Drive also may be temporarily affected. Temporary bus stops will be set up in coordination with AC Transit if stops adjacent to the construction area will not be safely accessed during construction.

PG&E will obtain all necessary road permits, including encroachment permits, prior to construction and will comply with all the applicable conditions of approval. PG&E will apply for a Traffic Control Plan from the City of Oakland, and any permits required by the cities of Piedmont and Orinda. As required by the City of Oakland, a TMP will establish methods for minimizing construction effects on transit service. The TMP will include consultation with AC Transit and any other affected transit agency prior to construction to reduce potential interruption of transit services. With the completion of the project, public transit operation will return to preconstruction conditions. The project will not substantially delay public transit. Therefore, the impact will be less than significant.

Operations and Maintenance

PG&E O&M will not substantially delay public transit because, upon completion, the overhead lines and structures will be in a similar configuration and alignment as the existing condition, and the remaining changes will be underground lines that will not interfere with bus service. The O&M activities for the underground portion of the project may require occasional lane closures along Park Boulevard (for example because of a major repair to an underground vault). Such closures will be brief and bus service will not be delayed since at least one lane will remain open. PG&E O&M will not affect public transit services. Therefore, no impacts will occur.

5.18 Tribal Cultural Resources

5.18.1 Methodology and Environmental Setting

This section describes existing conditions and potential impacts on TCRs as a result of project construction, operation, and maintenance. The analysis concludes that impacts on TCRs will be less than significant; the APMs described in Section 5.18.4.2 will further reduce the project's less-than-significant impacts on TCRs. The project's potential effects on TCRs were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.18-3 (refer to Section 5.18.3) and are discussed in more detail in Section 5.18.4.

5.18.1.1 Outreach to Tribes

Jacobs Senior Archaeologist, Tim Spillane, contacted the NAHC requesting an SLF search of the project area on December 1, 2023 (refer to Appendix G). The NAHC's response, dated December 4, 2023, stated that no Native American cultural sites are documented within the API. The NAHC also provided a list of 25 individual Native American contacts who may have knowledge about archaeological resources and TCRs in the area.

On behalf of PG&E Senior Cultural Resource Specialist (CRS), Christophe Descantes, Jacobs sent an initial outreach letter on January 9, 2024 (refer to Appendix G), to the contacts listed by the NAHC. This letter included information about the proposed project, cultural resource findings to date, and a map showing the project location. The letter also invited comments or questions relating to the project. Hard copies were sent to the addresses provided by the NAHC, along with electronic copies sent via email. To date, two responses have been received.

Coordination between PG&E and the responding tribes regarding the project is currently under way and any formal comments or recommendations provided by the tribes will either be addressed by the PG&E CRS or forwarded to the CPUC, as appropriate. Additional information on tribal outreach completed in support of the project is provided in Table 5.18-1.

Table 5.18-1. Summary of the Native American Outreach Efforts

Native American Tribes	Contact	Date of Letter	Response/Date
Amah Mutsun Tribal Band of Mission San Juan Bautista	Irene Zwierlein	January 9, 2024	No response
Chicken Ranch Rancheria of Me-Wuk Indians	Lloyd Mathiesen	January 9, 2024	No response
Confederated Villages of Lisjan Nation	Corrina Gould	January 9, 2024	Tribal Chair, Corrina Gould, replied via email on 01/10/2024 requesting record search results, SLF search results, project archaeological reports, and the final environmental document for the project. Mr. Spillane replied via email on 01/11/2024 providing the SLF results and a summary of cultural resource findings to date. Ms. Gould was told that the other cultural documentation would be sent when finalized.
	Cheyenne Gould	January 9, 2024	Tribal Cultural Resource Manager, Cheyenne Gould, replied via email on 04/10/2024, to confirm whether the cultural resource documents had been finalized. Mr. Spillane replied via email on the same day, confirming that they were still being drafted but would be provided when complete.
	Deja Gould	January 9, 2024	No response

Table 5.18-1. Summary of the Native American Outreach Efforts

Native American Tribes	Contact	Date of Letter	Response/Date
Guidiville Rancheria of California	Bunny Tarin	January 9, 2024	No response
	Michael Derry	January 9, 2024	No response
Indian Canyon Mutsun Band of Costanoan	Kanyon Sayers-Roods	January 9, 2024	No response
	Ann Marie Sayers	January 9, 2024	No response
Muwekma Ohlone Indian Tribe of the San Francisco Bay Area	Monica Arellano	January 9, 2024	No response
Nashville Enterprise Miwok-Maidu-Nishinam Tribe	Leland Valdez	January 9, 2024	No response
	Cosme Valdez	January 9, 2024	No response
Northern Valley Yokut / Ohlone Tribe	Timothy Perez	January 9, 2024	No response
	Jessica Murga	January 9, 2024	No response
	Erolinda Perez	January 9, 2024	No response
	John Murga	January 9, 2024	No response
The Ohlone Indian Tribe	Vincent Medina	January 9, 2024	No response
	Andrew Galvan	January 9, 2024	Chairperson, Andrew Galvan, responded via email on 01/09/2024 requesting the cultural resources assessment, any related documentation when completed, and final archaeological recommendations for the project. He also requested the NAHC's response letter and list of tribal contacts. Mr. Spillane replied via email on 01/10/2024, providing the requested NAHC response letter and tribal contact list, as well as a summary of cultural resource findings to date. Mr. Galvan was told that the other cultural documentation would be sent when finalized.
	Desiree Vigil	January 9, 2024	No response
Wilton Rancheria	Herbert Griffin	January 9, 2024	No response
	Dahlton Brown	January 9, 2024	No response
	Cultural Preservation Department	January 9, 2024	No response
Wuksachi Indian Tribe/Eshom Valley Band	Kenneth Woodrow	January 9, 2024	No response

5.18.1.2 Tribal Cultural Resources

An Archaeological Survey Report for the project was prepared by Jacobs in June 2024. Because the report contains confidential information about the locations and characteristics of cultural resources, the technical report is not included in this Proponent's Environmental Assessment for public review, but it can be made available to agencies and other professionals for review as necessary. The study included a cultural resources records search, outreach with Native American individuals and organizations, outreach with a local historical society, buried site sensitivity analysis, and an intensive pedestrian survey of the project area. The following section summarizes the results of this study and efforts to identify TCRs within the API.

The record search did not identify any indigenous cultural resources within the API. Only one indigenous archaeological site has been previously recorded within 0.25 mile despite 109 past cultural resource studies within that range. The resource is a single bedrock mortar (C-474) northeast of the API. The buried site sensitivity analysis finds that, based on several site-specific variables – the age of the underlying landform, distance from natural freshwater sources, paucity of known archaeological sites within 0.25 mile, and extent of past disturbances – the potential for discovery of intact archaeological deposits, including buried archaeological deposits, materials, or features, by implementing the project is low.

The SLF search conducted by the NAHC did not identify any known culturally sensitive sites. No precontact resources have been identified within the API ahead of the AB 52 tribal consultation process. The NAHC and Native American tribe correspondence is listed in Table 5.18-1 and copies are provided in Appendix G. Two Native American stakeholders responded with requests for additional information.

On January 9, 2024, Ohlone Indian Tribe Chairperson, Andrew Galvan, replied via email requesting the cultural resources assessment, any related documentation once completed, and final archaeological recommendations for the project. He also requested the NAHC's response letter and list of tribal contacts. Mr. Spillane replied via email on January 10, 2024, providing the requested NAHC response letter and tribal contact list, as well as a summary of cultural resource findings to date. Mr. Galvan was told that the other cultural documentation would be sent once finalized.

On January 10, 2024, Confederated Villages of Lisjan Nation Tribal Chair, Corrina Gould, replied via email requesting record search results, SLF search results, project archaeological reports, and the final environmental document for the project. Mr. Spillane replied via email on January 11, 2024, providing the SLF results and a summary of cultural resource findings to date. He told Ms. Gould that the other cultural documentation would be sent when finalized.

PG&E will forward Native American tribe project correspondence received to the CPUC cultural project lead after the project application is filed with the CPUC.

5.18.1.3 Precontact Context

Early archaeological investigations in the Bay Area were conducted by Nels Nelson in 1907 and 1908 and resulted in the identification of more than 400 "shell heaps, earth mounds, and a few minor localities that cannot be termed anything but temporary camp sites" (Nelson 1909). Nelson recorded more than 100 shellmounds along the bay shore of Alameda and Contra Costa counties, including some of the most important sites in central California, and mapped 18 sites in San Francisco County. Three sites in the northeast Bay provided the basis for the initial study of cultural change in central California. These sites include the Emeryville shellmound (CA-ALA-309) in Alameda County, and two sites in Contra Costa County, the Ellis Landing site (CA-CCO-295) and the Fernandez site (CA-CCO-259), which is located slightly inland in Rodeo Valley.

Also, during the early 1900s, Llewellyn L. Loud described and mapped the remains of a dozen mounds at the north end of the Santa Clara Valley (Loud 1912). Many of the mounds were located within Rancho Posolmi and had already been disturbed or demolished by farming activities or construction. Loud's excavations at CA-SCL-1, often referred to as the Castro Mound or Ponce site (Heizer and Beardsley 1954; Beardsley 1954; Moratto 2004), were among the earliest and most extensive in the project vicinity. Among the cultural remains documented in the large mound midden were two house floors and 61 burials, many with mortuary items. Compared to other Bay Area mounds from the same period, Loud noted a difference in the number and type of shellfish remains in the assemblages from the South Bay sites.

The studies in the Bay Area conducted in the early 1900s on the northern, eastern, and southern Bay shores formed the basis for an initial study of cultural change in the Bay Area and the Sacramento-San Joaquin Delta and led to the later development of the Central California Taxonomic System (CCTS). The CCTS is the result of efforts of a number of researchers (Beardsley 1948; Heizer and Beardsley 1954; Heizer 1949) and has been further refined over the succeeding decades. The tripartite CCTS classification scheme defines three temporal periods (Early, Middle, and Late; Table 5.18-2) that are marked by changes in distinct artifact types, subsistence orientation, and settlement patterns. The generalized periods are associated with regionally based cultural patterns (Bennyhoff et al. 1994; Fredrickson 1973, 1974; Wallace 1955, 1978).

Table 5.18-2. Chronology and Regional Cultural Patterns in Bay Area Prehistory

Period	Cultural Pattern	Timeframe
Early Period	Millingstone Pattern	11,000–5,500 years before present (B.P.)
	Windmiller Pattern[a]	5,500–2,500 B.P.
Middle Period	Berkeley Pattern	2,500–1,000 B.P.
Late Period	Augustine Pattern	1,000 B.P. to Historic Contact

[a] The presence of the Windmiller Pattern during the Early Period in the Bay Area is controversial (Bennyhoff, Fredrickson, and Hughes 1994; Gerow and Force 1968; Gerow 1974; Heizer 1949; Moratto 2004) and may be referred to elsewhere as the Lower Berkeley Pattern (Milliken et al. 2007).

Early Period (11,000–5,500 B.P.)

There is limited archaeological evidence of occupation in the Bay Area dating earlier than 6,000 years ago during the Early Holocene when sea levels were dramatically lower than today. It is likely that sea-level rise and Holocene alluvial deposits, which are up to 33 feet (10 meters) thick in some locations around the Bay region, buried many prehistoric sites in this area (Meyer 2004; Moratto 2004; Ragir 1972). One of the oldest cultural deposits in the Bay Area is in the Coyote Narrows at the Metcalf Road/U.S. Highway 101 overcrossing at Tulare Hill. The Metcalf site (CA-SCL-178) was discovered 3.3 meters below the surface in soil buried at the mouth of Metcalf Creek and the earliest occupation layer dates to 11,050–9,475 cal B.P. (Meyer and Rosenthal 2007). At another Bay Area millingstone site (CA-SCL-65), two flexed burials were found beneath cairns of millingstones dating between 7,500 and 7,000 years ago (Fitzgerald 1993). Along with the Sand Hill Bluff shellmound on the peninsula coast of Santa Cruz County (CA-SCR-7), the artifact assemblages in these Millingstone Pattern sites include large numbers of handstones and milling slabs, as well as core and flake tools (Hylkema 2002:233–235).

Windmiller Pattern sites in the Sacramento Valley and Sacramento-San Joaquin Delta often contain manos and metates (grinding stones), as well as many mortar fragments, large obsidian concave base and stemmed projectile points, rectangular Olivella beads, perforated and phallic charmstones, ventrally extended burials, and a westerly orientation of graves. Artifact assemblages from the South Bay peninsula, such as from CA-SCL-354 in the Los Altos foothills, including Olivella rectangular beads (type L1) and Rossi square-stemmed and large side-notched projectile points, imply that characteristics of Windmiller assemblages were present (Hylkema 2002:244, 250). Moratto (2004) suggests that migrations into the Bay-Delta Region around 4,500 B.P. may have introduced the Windmiller Pattern, displacing earlier Hokan-speaking inhabitants. The Windmiller migration hypothesis finds some support from strontium isotope analysis of human remains recovered from the Marsh Creek Site (CA-CCO-548) in Brentwood, Contra Costa County (Byrd et al. 2017; Jorgenson et al. 2009).

Middle Period (2,500–1,000 B.P.)

The Berkeley Pattern is found throughout the Bay region during the Late Holocene. The earliest assemblages attributable to this pattern are coeval with the Windmiller Pattern, including the lower levels of the West Berkeley site (CA-ALA-307) in Alameda County and the University Village site (CA-SMA-77) in San Mateo County (Elsasser 1978; Wallace and Lathrop 1975). Artifacts typical of the Berkeley Pattern include spire-lopped (Types A1a and A1b) Olivella shell beads, bone tubes and beads, bird-bone whistles, quartz crystals, serrated mammal scapulas, and ground bone awls (Elsasser 1978; Moratto 2004; Bennyhoff and Hughes 1987). Projectile points are commonly contracting stemmed and lanceolate types, some of which are made from obsidian (Hylkema 2002). Burials are variable flexed and semi-flexed with inconsistent orientation, there is an increase in mortuary items, particularly during the Late Middle Period, compared to few mortuary items identified during the Early Period in Bay Area sites.

Milling implements include large and small boulder or cobble mortars and various types of pestles, suggesting small seeds or acorns formed an important part of the diet. In the South Bay, processing of hard seeds continued to be important throughout this period, as evidenced by the number of milling slabs and handstones in the artifact assemblages from this area (Hylkema 2002). Other plant resources included hazelnuts, cattail seeds, grass, and soaproot bulbs; the latter were roasted in earth ovens. Faunal analyses indicate the diet during this period was rich and varied, with a variety of small and large mammals, fish, and birds, as well as mussel, oyster, and clam.

Shellfish species exploited varied depending on location within the Bay Area (Hylkema 2002). Along the West Bay in San Mateo County and the East Bay of Alameda County, bay mussel, oyster, and clam are more prevalent. In contrast, horn snail, oyster, and bay mussel are the principal shellfish recovered from South Bay mounds. Large accumulations of shellfish remains, or "shellmounds," formed over hundreds, or even thousands, of years through accretion at village sites fronting the Bay that were reused seasonally or year-round (Lightfoot 1997). Numerous shellmounds contain hundreds of burials as well as ceremonial items, house floors, hearths, and storage pits, indicating they were used as burial, ceremonial, and residential places (Lightfoot 1997; Lightfoot and Luby 2002).

The well-known Emeryville shellmound (CA-ALA-309) and Ellis Landing site (CA-CCO-295) also date to this period. Within the current project area and the former Rancho Posolmi, radiocarbon dates obtained from excavations conducted in 2008 in the mound initially recorded in 1912 by Loud indicate CA-SCL-12/H was occupied throughout the Late Early Period and Middle Period (3,300–2,400 B.P.) with some evidence of Late to Historic Period occupation (Byrd and Berg 2009; Loud 1912). During recent excavations, a variety of cultural materials, including lithic flakes and tools, shellfish, faunal bone, and human remains, were recovered from intact occupation components at depths up to 5.9 feet (1.8 meters) below the surface. CA-SCL-12/H also included the gravesite of Lope Yñigo, who is among the few Native Americans that were awarded Mexican land grants (Byrd and Berg 2009; Shoup and Milliken 1999).

Late Period (1,000 B.P. to Historic Contact)

In the Bay Area, the Augustine Pattern follows the "golden age of shell mound communities" of the Berkeley Pattern (Lightfoot and Luby 2002). Numerous changes in subsistence, foraging, and land use patterns that begin to reflect the use pattern known from Historic Period Native American groups in the area is evident. The pattern is identified by the introduction of bow and arrow technology, the use of harpoons, and tubular tobacco pipes. There is an increase in the intensity of subsistence exploitation that correlates directly with population growth, and greater emphasis is placed on the procurement and processing of vegetal foods, especially acorns, as evidenced in the increase of milling tools, especially the mortar and pestle (Moratto 2004). Both coiled and twined basketry were used as domestic and ceremonial items.

Population size and the number of settlements increased during this period, although the large shellmound villages of the Berkeley Pattern were apparently no longer favored residential places and many were abandoned (Lightfoot and Luby 2002). The dry conditions during the Medieval Climatic Anomaly, which produced droughts across the West between approximately A.D. 650–850 and A.D. 1150–1250 (Jones et al. 1999) may be related to the abandonment of shellmound villages as primary residential locations (Lightfoot and Luby 2002). Settlement strategies were apparently reorganized and focused on a dispersed pattern, with the establishment of both coastal and interior habitation areas, coinciding with the exploitation of seasonally available resources.

The Augustine Pattern ushers in a time of status differentiation and the rise of secret societies and cults and associated traits. Exchange networks, with the use of clamshell disk beads as a form of currency, expanded during this period. Exchange items included magnesite, steatite, Olivella beads, and obsidian. Compared to the Middle Period, the use and occurrence of shell beads with burials blossomed (Bennyhoff and Milliken 1993; Milliken et al. 2007). Haliotis banjo pendants may represent the introduction and spread of the Kuksu cult, beginning during the transition from the Middle to Late Period in the Bay Area (Hylkema 2002). The magnitude of non-dietary Olivella shells in coastal sites during the Late Period, coupled with a concomitant increase of the shells in mortuary contexts throughout central California during this period, attests to the rise of both exchange networks and status differentiation, with coastal peoples supplying the shells to the interior groups.

5.18.1.4 Ethnographic Context

The project is at the interface of the ethnographic territories of the Bay Miwok and the Ohlone (also known as Costanoan) and, with the Bay Miwok occupying those on the eastern section and the Ohlone occupying lands on the western and central sections of the project area. While Native American stakeholders have not indicated a need for standalone ethnographies to be produced, ethnographic contexts for each of the tribes with ties to the project area are provided in the following subsections.

Ohlone (Costanoan)

The western portion of the project area is within the ethnographic territory of the Ohlone, or Costanoan tribe. Specifically, the project is on lands occupied by the Huchiun subgroup of Costanoans in the Huchiun-Southern tribal region, which is estimated to have supported a population of 360 individuals at the time of the first European contact (Byrd et al. 2017; Levy 1978a; Milliken 1995a). Despite a history of devastation and displacement brought about by exposure to nonlocal diseases and impositions of the Spanish Mission system followed by non-native settlers (Milliken 1995a), Ohlone people today continue to live in their traditional territory within Contra Costa and Alameda counties and continue traditional cultural practices. Some participate in local planning and development projects as consultants and construction monitors to oversee treatment of their cultural heritage and resources of cultural and sacred importance.

What is known of the traditional Ohlone way of life has been transmitted through written records from early European contact with explorers and trappers, from the Spanish Mission system written records, and from studies by non-native scholars who wrote about Ohlone peoples. Linguistic and archaeological findings have provided some information as well. The following brief description is based on Levy (1978a), Harrington (1942), Kroeber (1925), Lightfoot and Parrish (2009), Milliken (1995a), and Heizer and Elsasser (1980a), and is meant as an introduction, rather than an exhaustive description of Ohlone culture.

Approximately 40 tribelets, each made up of multiple villages, were noted at the time of contact in the 18th century. Each tribelet was led by a chief and council of elders. Each village was composed of an amalgam of family households. Households were made up of approximately 15 people, and social organization was patrilineal. Tribelets had complex interactions with one another (Milliken 1995a). Religious culture involved prayer and the offering of valuables such as beads, headdresses, tobacco, and other goods, while shamanic leaders mediated between the tribes and supernatural powers in more direct ways (Levy 1978a). Important parallels can be drawn between the mythologies of the Ohlone and those of the Coast Miwok, Pomos, Wappos, and Patwins (Milliken et al. 2009). The mythological tradition of the Ohlone centralized Coyote who created the world, received the prayers of tribal members, and guided them in the afterlife. The Bay Area landscape for example was imbued with religious meaning, "so that myth and ceremony became a unique constitution for local sovereignty… [and] each tribe might be thought of as an independent, landholding religious congregation" (Milliken 1995b:13).

Acorns were a dietary staple supplemented by a wide variety of other nuts, seeds, tubers, berries, herbs, fish, and animal resources. Acorns were ground into flour with mortar and pestle; the nut was made into bread and other dishes. In addition to the deer, rabbits, and fish available in the area today, other large herbivores, including elk and pronghorn antelope, were exploited in the past. Marine resources such as Olympia oyster (*Ostrea l*urida), California mussel (*Mytilus californianus*), and waterfowl also represented a large portion of the Ohlone diet. Horned sea snails were harvested in significant numbers by the Ohlone tribes during the Late Period (Milliken et al. 2007). The Ohlone supplemented these primary foods with resources acquired through extensive trade networks with the Plains and Sierra Miwok, Patwins, Yokuts, and others. Controlled burning of local land was carried out in the fall to ensure a healthy supply of plant foods each year (Levy 1978a).

Ohlone used laurel branches, tule, grass, willow boughs, and ferns to make thatched and domed shelters. Other structures included sweathouses that were dug into creek banks and circular dance floors. Woven baskets had many uses, including storage, cooking, acorn preparation, and fish traps. Baskets and articles of personal adornment were detailed with feathers, shell beads, and other items, including mica and ocher. Local rock was used to line fire pits and to form hand tools such as pestles for grinding. Locally available rock such as chert was struck to form sharp-edge tools like scrapers and knives and was supplemented by imported obsidian, which was obtained through trade and exchange.

Significant technological distinctions are evident in the material culture of the Ohlone of the San Francisco Bay Area and those inhabiting the Monterey region; lithic tool type differences offer the most abundant examples (Milliken et al. 2009). Numerous ornamental feathered items were produced for ceremonial performances and other secular uses, including robes, staffs, and weaponry (Kelly 1976). Canoes or balsas made of tule were constructed and used for navigation through marshland channels, promoting trade and productive hunting and fishing. Coiled and twined basketry occasionally ornamented with feathers and beads facilitated Ohlone life in the form of food storage containers, cradles, cooking implements, and myriad other crafts. Production and labor tasks were divided along gender lines, with women being responsible for the harvesting of vegetal resources and basket weaving, and men for the bulk of the hunting, fishing, and the construction and placement of traps for wild game (Milliken 1995b; Milliken et al. 2009).

The Ohlone first came into contact with Spanish explorers in 1602, when Sebastián Vizcaíno came to shore in Monterey. The earliest documented encounters between the San Francisco Bay region Ohlone and the Spanish take place during the Portolá Expedition of 1769 and continue with the intrusion of later explorers Fages (1770), Anza (1774, 1776), Rivera (1774), and Moraga (1776). While these initial interactions were likely brief, contact between indigenous tribes and the Spanish would become lasting and profoundly consequential with the institution of the California Mission system. Between the arrival of Portolá and company and the year 1797, seven Catholic Missions were established in territory occupied by Ohlone tribes, including in San Francisco, San Jose, and Santa Clara. By 1810, most indigenous people in the Bay Area had been absorbed into the Missions, which required the large-scale abandonment of their traditional way of life. For the Ohlone, the combined effect of a marked reduction in birth rate and the introduction of diseases against which indigenous Californians had little defense created a dramatic drop in population size. Ohlone populations fell 80 percent from an estimated 10,000 people in 1770, to 2,000 by 1832 (Cook 1943; Levy 1978a).

During the Mission Period, indigenous Northern California tribes from numerous linguistic and cultural backgrounds were brought together under the control of the Catholic Church. In the process, separations occurred between related groups, with individuals from particular tribal bands often being sent to different work camps and Missions. This abrupt tribal fracturing and concurrent intertribal mélange coalesced to make the retention of traditional and distinct indigenous subcultures practically impossible. As subsequent generations were born into the established colonial institutions, separations and dislocations were exacerbated. As an example, by the time the Mission system was being dismantled in 1834, only 37 of the 190 Native Americans registered at Mission Dolores were identified as descendants of the San Francisco Peninsula Ohlone. Nevertheless, thousands of indigenous people today trace their ancestry back to speakers of languages within the same family as San Francisco Bay Costanoan (Milliken et al. 2009).

Bay Miwok

The eastern side of the project area is in the ethnographic territory of the Bay Miwok (also spelled Mi-wuk) who occupied the eastern portion of Contra Costa County in the area of Mount Diablo, from Walnut Creek in the west, to the Sacramento-San Joaquin Delta in the east. They are one of five Eastern Miwok tribes (Bay, Plains, Northern Sierra, Central Sierra, and Southern Sierra) whose Eastern Miwok language derives from the Miwokan branch of the Utian language family, a subgroup of the Penutian linguistic group. Specifically, the eastern portion of the project was occupied by the Saclan subgroup, constituted of roughly 250 individuals at the time of European contact (Byrd et al. 2017). Neighboring groups included the Ohlone to the southwest, the Northern Valley Yokuts to the southeast, the Plains Miwok to the east, and the Patwin to the north (Byrd et al. 2017; Kroeber 1925; Levy 1978a).

The Eastern Miwok relied primarily on gathering wild foods and hunting mammals for subsistence. They practiced controlled burning to ensure ample forage for mule deer, tule elk, and antelope, which they hunted. Among the plant foods exploited were greens collected in the spring and acorns collected in the fall. Acorns were of particular importance to the diet, and seven varieties were used. Nuts collected included buckeye (*Aesculus californica*), laurel (*Umbellularia californica*), hazelnut (*Corylus cornuta* var. *californica*), digger pine (*Pinus sabiniana*), and sugar pine (*Pinus lambertiana*). Oak trees from which this staple food was gathered annually were carefully preserved by the Eastern Miwok (Levy 1978a; Heizer and Elsasser 1980b). Rabbit, salmon, valley quail, gray pine nuts, blue oak acorns, and live oak acorns were obtained in the foothills and shellfish, including California mussel (*Mytilus californianus*), Olympia oyster (*Ostrea lurida*), and bent-nose clam (*Macoma nasuta*) were collected from the Bay estuary.

Political units among the Miwok were structured by similarities in language and ethnicity, and villages were divided into "tribelets" (Levy 1978c). Tribelets controlled specific lands and the natural resources within that territory. The population size of one Bay Miwok tribelet, probably the Chupcan, was estimated to be approximately 400 by Juan Bautista de Anza while on an expedition in the Antioch area on April 3, 1776. The total population size of the Bay Miwok at the time of contact may have been approximately 1,700 (Levy 1978b). The tribelet was the main political unit of all Eastern Miwok tribes. Each tribelet was an independent and sovereign population with a defined and bounded territory and control of the resources of that territory. Typically, within that territory were several campsites for use at various times during the hunting and gathering season. The main house type in Bay Miwok territory was a thatched structure with a conical framework and a thatch of brush, grass, or tule attached to the top. Villages contained acorn granaries, winter grinding houses, and conical sweathouses (Levy 1978b).

Similar to other California Native American groups, the Eastern Miwok employed a variety of tools, implements, and enclosures for hunting and collecting natural resources. The bow and arrow, snares, traps, nets, and enclosures or blinds were used for hunting land mammals and birds. For fishing, they made canoes from tule, balsa, or logs, and used harpoons, hooks, nets, and basketry traps. To collect plant resources, they used sharpened digging sticks, long poles for dislodging acorns and pinecones, and a variety of woven tools (seed beaters, burden baskets, and carrying nets; Levy 1978b).

Foods were processed with a variety of tools, such as bedrock mortars, cobblestone pestles, anvils, and portable stone or wooden mortars that were used to grind or mill acorns and seeds. Additional tools and implements included knives, anvils, leaching baskets and bowls, woven parching trays, and woven strainers and winnowers. Prior to processing, the acorns were stored in the village granaries. Earth ovens were used by the Eastern Miwok to bake acorn bread. The Miwok participated in an extensive east-west trade network between the coast and the Great Basin. From coastal groups, marine shell (Olivella and abalone) and steatite moved eastward, while salt and obsidian traveled westward from the Sierras and Great Basin. Basketry, an important trade item, moved in both directions (Levy 1978b).

The Bay Miwok was the earliest of the Eastern Miwok groups to be missionized, with the first neophytes arriving at Mission San Francisco in 1794. A large number of Bay and Plains Miwok tribelets died or relocated as a result of encroachment, conversion, and epidemic disease. The discovery in 1848 of gold in the western Sierra Nevada foothills and the ensuing Gold Rush led to a flood of non-indigenous peoples into Miwok territory. Their reliance on cash income increased as the availability of natural resources declined with the growth of non-Miwokan communities and towns in their traditional territory (Levy 1978b).

During the first half of the 1900s, the federal government acquired lands and established reservations, or rancherias, for the Eastern Miwok (Levy 1978b). The U.S. Bureau of Indian Affairs terminated relations with most of these rancherias between 1934 and 1972, but status has been restored to the majority of the rancherias, beginning in 1984. No reservations were established in Southern Miwok territory, and rancherias there and in other parts of Eastern Miwok territory received no official recognition by the federal government. At present, there are seven federally recognized rancherias (Wilton, Shingle Springs, Jackson, Buena Vista, Sheep Ranch, Tuolumne, and Chicken Ranch) in Amador, Calaveras, El Dorado, Lake, and Tuolumne counties that have primarily or exclusively Eastern Miwok populations (BIA 2015; California Indian Assistance Program 2011).

5.18.1.5 Record Search Results

A search of PG&E's CCRD was conducted in November 2023. The CCRD includes both PG&E's in-house records and California Historical Resources Information System records on file at the Northwest Information Center, Sonoma State University in Rohnert Park. The records search included a 0.25-mile buffer radius on the API.

The CCRD search indicates that 109 cultural resource investigations have been conducted previously within 0.25 mile of the project area. Twenty-two of these past investigations are regional or thematic studies that did not include focused survey. Of the 87 remaining cultural resource studies, 59 included survey or other focused investigation of portions of the project alignment, covering approximately 60 percent of the total project area. They were completed between 1974 and 2023.

The records search also indicates that 97 cultural resources have been previously recorded within the 0.25-mile record search radius. Most are historical structures. Of these, 31 are plotted within the API and all resources in the API are historic period resources. No indigenous resources of any kind have been previously recorded within the API and only one has been recorded within the 0.25-mile record search radius. The known indigenous resource is an informally recorded bedrock mortar on an agate rock formation northeast of the project (C-474).

For additional details on the results of the CCRD search, refer to Section 5.5, Cultural Resources.

5.18.2 Regulatory Setting

5.18.2.1 Federal

No federal regulations related to cultural resources are applicable to the project.

5.18.2.2 State

AB 52 established that TCRs must be considered by the lead agency under CEQA. AB 52 provides for additional Native American consultation requirements to be undertaken by the lead agency. A TCR is a site, feature, place, cultural landscape, sacred place, or object that is considered of cultural value to a California Native American tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

5.18.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for air districts and certified unified program agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

Background research finds that no TCRs designated for local listing in the City of Orinda, Contra Costa County, the City of Oakland, or the City of Piedmont, are present with the project area.

5.18.3 Impact Questions

The project's potential effects on TCRs were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.18-3 and discussed in more detail in Section 5.18.4.

5.18.3.1 Impact Questions

Table 5.18-3. CEQA Checklist for Tribal Cultural Resources
[Checklist determination by CPUC during tribal consultation.]

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 a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☐	☐	☐	☐
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☐	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☐

5.18.3.2 Additional CEQA Impact Questions

None.

5.18.4 Potential Impact Analysis

Project impacts related to TCRs were evaluated against the CEQA significance criteria and are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.18.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. In accordance with Appendix G of the CEQA Guidelines, the potential significance of project impacts on TCRs were evaluated for each of the criteria listed in Table 5.18-3, as discussed in Section 5.18.4.3.

5.18.4.2 Applicant-Proposed Measures

PG&E will implement the following APM:

APM TCR-1: Undiscovered Potential Tribal Cultural Resources. After stopping work and following the procedure for determining eligibility in APM CUL-2, in the event that a prehistoric or protohistoric site is identified and cannot be avoided, PG&E will contact the CPUC to identify an appropriate tribe with whom to consult on treatment.

If no agreement can be reached for mitigation after discussions with the California Native American tribe(s) or it is determined that the tribe(s)' preferred mitigation is not feasible, PG&E will implement one of the example mitigation measures listed in Public Resources Code Section 21084.3(b), or other feasible mitigation.

5.18.4.3 Impact Questions

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

5.18.4.4 Potential Impact Analysis

The project's potential effects on TCRs will be evaluated by the CPUC during the AB 52 process using the significance criteria set forth in Appendix G of the CEQA Guidelines.

a) **Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:**

   i. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section5020.1(k), or**

      Impact Determination to be provided by CPUC

Potential Impact Discussion

The project's potential effects on TCRs will be evaluated by the CPUC during the AB 52 process.

a) **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

   Impact Determination to be provided by CPUC

Potential Impact Discussion

The project's potential effects on TCRs will be evaluated by the CPUC during the AB 52 process.

5.19 Utilities and Service Systems

This section describes existing conditions and potential impacts on utilities and service systems from construction, operation, and maintenance of the project. The analysis concludes that, although these resource areas will be temporarily affected by project construction, project-related impacts to utilities and service systems will be less than significant. Under the CEQA, utilities and service systems include water, wastewater, and solid waste collection and treatment. This section also addresses potential impacts on power, natural gas, and telecommunication facilities. The project's potential effects on utilities were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines The conclusions are summarized in Tables 5.19-2 and Table 5.19-3 and discussed in more detail in Section 5.19.4.

5.19.1 Methodology and Environmental Setting

5.19.1.1 Methodology

County and city plans and official websites were reviewed for wastewater collection and treatment, water supply, stormwater drainage, solid waste disposal, telecommunication, electricity, and natural gas service providers within the project area. The project-related work at substations that will occur within existing, fenced facilities will have no impact on utilities or service systems and is not discussed further. Electric and gas services information was obtained from PG&E and from municipal websites. Individual utility provider websites documented coverage areas and system information. These providers and agencies included EBMUD, Contra Costa County Flood Control and Water Conservation District, Ava Community Energy (formerly East Bay Community Energy), City of Orinda Central Sanitary District, PG&E, and a variety of telecommunication providers detailed in the following subsections. The references section includes a complete list of documents and websites that were reviewed to develop this analysis.

5.19.1.2 Environmental Setting

Utility Providers

Electricity and Natural Gas

PG&E and Ava Community Energy provide electricity to the project area. PG&E's 2022 electric power mix consisted of 49 percent nuclear power, 38 percent renewable energy, 8 percent large hydroelectric power, and 5 percent natural gas (PG&E 2023), and it delivers electricity to customers through its transmission and distribution systems. Ava Community Energy is a not-for-profit public agency that procures electric energy for residents and communities that opt to participate in the service; the electricity is delivered through PG&E-owned and operated infrastructure. Ava Community Energy's power primarily is sourced from renewable energy and large hydropower, with a goal of purchasing 100 percent clean power by 2030 (Ava Community Energy 2023). PG&E provides natural gas services to the project area (PG&E 2014).

Electricity or natural gas supply required during construction or operation of the project will be provided by PG&E, if required.

Stormwater Drainage

The main project components are in the San Francisco Bay area, where the major rivers and tributaries flow into the San Francisco Bay. The San Francisco Bay watershed covers an area of 4,600 square miles, of which the Bay encompasses 1,600 square miles. The Bay Area is home to more than 7 million people and is one of the densest urban areas in the nation (EPA 2023).

Along the project route, stormwater flows through pipes and culverts into creeks, then out to San Francisco Bay (City of Oakland 2020). The Contra Costa County Public Works Department maintains unincorporated county public drainage facilities. The *Contra Costa Watershed Stormwater Resource Plan* (Contra Costa County 2019) developed for the County and its municipalities (including the city of Orinda) was created to help manage the stormwater system and associated facilities in Contra Costa County. The County has been divided into five watershed planning units. The project falls within the West County Planning Unit.

The Alameda Countywide Clean Water Program (Alameda County Flood Control and Water Conservation 2023) is established by a memorandum of understanding among the 14 Alameda County cities, Alameda County, the Alameda County Flood Control and Water Conservation District, and the Zone 7 Water Agency. All these agencies are Permittees in the Municipal Regional Permit. The Program implements common tasks and assists the member agencies to implement their local stormwater pollution prevention programs. The Clean Water Program is set to protect and enhance local creeks and watersheds through promoting watershed stewardship and pollution prevention practices.

Both the City of Oakland and the City of Piedmont stormwater drainage system are managed by their Public Works department. Oakland is rehabilitating the aging stormwater infrastructure and has assigned priority areas throughout the city. The project falls within the lowest priority zones for stormwater infrastructure replacement (City of Oakland 2023a). Refer to Section 5.10, Hydrology and Water Quality, for further discussion of area drainage.

There are no community stormwater drainage systems within the project area.

Telecommunications

A variety of telecommunications companies, including AT&T, Xfinity by Comcast, Verizon, Viasat, HughesNet, Unwired, Always on, Google Fiber Webpass, Sonic, Starlink, Earthlink, and other companies, provide wireless phone service, television, and Internet in Contra Costa County, the City of Oakland, the City of Orinda, and the City of Piedmont (Broadbandnow 2023).

Water Supply

EBMUD's water system serves approximately 1.4 million people in a 332-square-mile area extending from Crockett on the north, southward to San Lorenzo (encompassing the major cities of Oakland and Berkeley), eastward from San Francisco to Walnut Creek, and south through the San Ramon Valley (EBMUD 2023a). EBMUD manages water system operations and maintenance and delivers water from the Sierra Nevada Mountains to customers in the East Bay. EBMUD water customers include residential, industrial, commercial, institutional, and irrigation water users (EBMUD 2020).

Wastewater Collection and Treatment Services

The EBMUD wastewater system serves approximately 740,000 people in an 88-square-mile area of Alameda and Contra Costa counties along the Bay's east shore, extending from Richmond on the north southward to Oakland. EBMUD is responsible for collection, treatment, and disposal of wastewater in its service area. Wastewater in some areas of Contra Costa County and in the city of Orinda is managed through the Central Contra Costa Sanitary District (Central San 2023a). Some rural residential developments in unincorporated Contra Costa County as well as some residences in the Oakland hills area are not served by centralized wastewater systems and rely on individual septic systems (Central San 2023b). There are no known wells within the existing structure alignment or within city streets that are in the project area. EBRPD is responsible for wastewater management within its parks; facilities in Sibley Volcanic Regional Preserve are connected to septic systems (EBRPD 2018).

5.19.1.3 Utility Lines

A final determination on the need to relocate utilities will be made during final engineering. Localized underground utilities will be identified during final design and will be avoided or relocated with the facility owner. PG&E infrastructure in the project area includes gas distribution, electric distribution, electric power, and electric transmission lines. PG&E gas distribution lines may be in the project area where the power lines are proposed to be rebuilt underground in Estates Drive, Park Boulevard, and Park Boulevard Way. Multiple existing PG&E overhead and underground electric distribution lines cross the project area. Existing PG&E overhead electric power lines connect to Moraga Substation and underground to Oakland X Substation. Existing PG&E overhead electric transmission lines connect to Moraga Substation.

The City of Piedmont and the City of Oakland are expected to have buried stormwater facilities within the project area along Estates Drive, Park Boulevard, and Park Boulevard Way based on storm drain inlets observed during aerial map review. In addition, the City of Oakland has an online website with a sewer dashboard web portal with sewer and stormwater facilities (City of Oakland 2024). Refer to Figure 5.19-1 for an overview of existing buried sewer and stormwater facilities in Estates Drive, Park Boulevard, and Park Boulevard Way where the underground portion of the project is proposed. Telecommunication companies with aerial and buried lines in the project area include AT&T, Sonic, and Xfinity by Comcast. Aerial telecommunication lines typically are colocated on joint utility poles supporting PG&E electric distribution lines.

A 20-foot-wide EBMUD easement runs parallel to the PG&E property at Moraga Substation (Contra Costa County 2022). EBMUD also is expected to have underground water line facilities in Estates Drive, Park Boulevard, and Park Boulevard Way. Water line facilities typically include a main line in the street with lateral lines connecting with customers and to fire hydrants.

5.19.1.4 Approved Utility Projects

There are no known additional approved utility projects within the project construction access or work areas, or permanent alignments or facilities other than the current utility modifications that have been proposed for the Moraga–Oakland X 115 kV upgrade described in Section 3, Project Description. The project includes the updating of four of PG&E's existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Two sets of AT&T communication antennas on existing lattice tower structures will be relocated by AT&T.

PG&E's ongoing inspections of project structures, lines and substations and other PG&E infrastructure in the project vicinity will continue during the project's planning, construction and operations and maintenance phases. Maintenance activities may occur because of inspections or other situations requiring work on existing PG&E facilities including the project structures, line and substations.

5.19.1.5 Water Supplies

Most of EBMUD's water comes from the Mokelumne River watershed on the western slope of the Sierra Nevada Mountains and extends 90 miles to the East Bay. EBMUD's water supply system consists of a network of reservoirs, aqueducts (pipelines), water treatment plants, pumping plants, and other distribution facilities and pipelines that convey Mokelumne River water from Pardee Reservoir to EBMUD customers (EBMUD 2023b). EBMUD can deliver up to a maximum of 325 million gallons per day (mgd) from the Mokelumne River, subject to availability and flow releases. The system has two major dams and reservoirs, Pardee and Camanche, with a capacity of 209,905 and 431,500 acre-feet (AF), respectively. There are also two main aqueduct systems. The Mokelumne Aqueducts are comprised of three 82-mile-long pipelines. The aqueducts have a design capacity of 202 mgd by gravity and up to 325 mgd with pumping. The Lafayette Aqueducts are two parallel sets of pipes and tunnels. Pipelines are 2.9 miles long (EBMUD 2020). EBMUD's secondary water supply source is local runoff from the East Bay area watersheds, which is stored in the terminal reservoirs within EBMUD's service area. The local terminal reservoir system has a total capacity of 151,670 AF. The total system storage (from both the main and secondary water supply sources) is 771,980 AF with a total operational storage of 697,480 AF.

Demand for water in the EBMUD's service area is primarily for municipal and industrial uses, which include residential, commercial, institutional, industrial, and irrigation. While the number of accounts has increased steadily since 1970, the average daily water demand has not increased correspondingly. The average water demand in 2020 was 238 mgd, with a projected demand of 297 mgd in 2050. Several factors contribute to the slow rise in water demand, including EBMUD recycling and conservation programs, drought and customer rationing, changes in customer use patterns, and legislative changes (EBMUD 2020).

EBMUD recycles water for irrigation, industrial cooling, and toilet flushing. EBMUD has infrastructure with the capability to provide more than 9 mgd of recycled water (EBMUD 2023c)

5.19.1.6 Landfills and Recycling

Contra Costa County Conservation and Development's Solid Waste and Recycling Section oversees the collection of garbage, recycling, and organics in portions of the unincorporated County and implements programs to reduce solid waste disposal and promote reuse and recycling (Contra Costa County 2023).

The City of Oakland Department of Public Works provides waste collection services while implementing programs to reduce waste and increase the amount of recycling and compost processed (City of Oakland 2023b).

Within the City of Orinda, solid waste is managed by the Central Contra Costa Solid Waste Authority doing business as RecycleSmart (RecycleSmart 2023), including solid waste reduction, recycling, and refuse programs.

The City of Piedmont Department of Solid Waste oversees the collection of garbage, recycling, and organics and implements programs to reduce solid waste disposal and to promote reuse and recycling (City of Piedmont 2023a).

Waste-handling facilities that could accept construction or operation waste from the project, their capacities, and estimated closure dates are listed in Table 5.19-1. Treated wood waste and any contaminated soil or hazardous materials are expected to be taken to Kettleman Hills or Clean Harbors Buttonwillow.

Table 5.19-1. Landfills and Recycling Facilities

Landfill Name	Remaining Total Landfill Capacity (yd^3)	Landfill Average Daily Volume or Capacity	Estimated Closure Date	Takes Construction Waste?
Bee Green Recycling	Recycling only	Recycling only	Recycling only	Yes
Contra Costa Transfer & Recovery Station	Recycling only	Recycling only	Recycling only	Yes
Davis Street Transfer Station	Recycling only	Recycling only	Recycling only	Yes
Keller Canyon Landfill (Pittsburg)	63,408,410	3,500 tons per day	2050	Yes
Waste Management Altamont	65,400,000	11,150	2070	Yes
Waste Management Redwood	26,000,000	2,310 tons per day	2036	Yes – limited
Safety Kleen of California – oil recycling services	N/A Not a landfill	N/A Not a landfill	N/A Not a landfill	No (oil recycling & hazardous)
Newby Island Sanitary Landfill	16,400,000	4,000 tons per day	2041	Yes
Potrero Hills Landfill	13,872,000	4,330 tons per day	2048	Yes

Table 5.19-1. Landfills and Recycling Facilities

Landfill Name	Remaining Total Landfill Capacity (yd^3)	Landfill Average Daily Volume or Capacity	Estimated Closure Date	Takes Construction Waste?
Neal Road Recycling and Waste	20,847,970	1,500 tons per day	2048	Yes (recycling)
Forward Landfill (Manteca)	24,720,669	8,668 tons per day	2036	Yes
Chemical Waste Management – Kettleman Hills (Unit B18) (Kettleman Hills)	15,600,000	9000	2042	Yes (hazardous)
Clean Harbors Buttonwillow (Buttonwillow)	13,250,000 (maximum capacity)	10,500 tons per day	2040	Yes (hazardous)

Source: CalRecycle 2023. SWIS Facility/Site search

yd^3 = cubic yard(s)

5.19.2 Regulatory Setting

This section details the applicable federal, state, and local laws, policies, and standards for utilities and services in the project area.

5.19.2.1 Federal

No federal regulations pertaining to utilities and service systems are applicable to the proposed project.

5.19.2.2 State

California Government Code

Section 4216 of the California Government Code protects underground structures during excavation. Under this law, excavators must contact a regional notification center at least 2 days before excavation of any subsurface installations. In the project area, USA is the regional notification center. USA notifies utility providers with buried lines within 1,000 feet of the excavation, and those providers must mark the specific location of their facilities before excavation. The code also requires excavators to probe for and expose existing utilities, in accordance with state law, before using power equipment.

California Water Code

California Water Code Division 6, Part 2.10, Sections 10910 to 10915, requires that a city or county undertaking CEQA for a project identify public water systems that may supply water to the project. If such a public water system is not identified, the city or county must complete a water supply assessment. Per Section 10912, this requirement applies to residential and commercial projects larger than a certain size and to proposed industrial, manufacturing, or processing plants or industrial parks planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area. The requirement also applies to other projects that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project. If the city or county does not have an adopted urban water management plan, the water supply assessment must analyze whether the public water system's total projected water supplies available for normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

California Water Code Division 7 lays out the requirements for a statewide program for the control of the quality of all the waters of the state. Section 13140 of Division 7 states that the California State

Water Resources Control Board will formulate and adopt state policy for water quality control. Section 13172 of Division 7 includes requirements for waste management facilities, both hazardous and nonhazardous, as defined in Section 13173, to protect water quality.

California Hazardous Waste Fee Health and Safety Code

The Hazardous Waste Fee Health and Safety Code (California Health and Safety Code [CA HSC] Chapter 6.5, Section 25143 et seq.) provides definition and guidance on wood waste and its disposal. Wood waste is defined in part as poles, crossarms, pilings, and fence posts that have been previously treated with a preservative. Wood waste materials removed from electric, gas, or telephone service are exempt from the requirements for disposal provided certain conditions are met, including the following:

- If the wood waste is not subject to regulation as a hazardous waste under a federal act and it is disposed of in a composite-lined portion of a municipal solid waste landfill that meets any requirements imposed by the state policy adopted pursuant to Section 13140 of the Water Code and regulations adopted pursuant to Sections 13172 and 13173 of the Water Code.
- If the solid waste landfill used for disposal is authorized to accept the wood waste under waste discharge requirements issued by the RWQCB pursuant to Division 7 (commencing with Section 13000) of the Water Code.

5.19.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, PG&E is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

Contra Costa County

In 2004, Contra Costa County instituted a Construction and Demolition Debris Recovery Ordinance, which requires that at least 50 percent of jobsite debris generated by projects of 5,000 square feet or greater be recycled, reused, or otherwise diverted from landfill disposal. County permit applicants are required to submit an approved Debris Recovery Plan and form prior to applying for a building/demolishing permit (Contra Costa County 2004). Additionally, the applicant must submit a completed Debris Recovery Report prior to the final inspection and demonstrate that at least 50 percent (by weight) of jobsite debris was diverted from disposal in a landfill, by providing receipts and/or gate-tags from all facilities and service providers used for recycling, reuse, and disposal of jobsite debris.

City of Orinda

Chapter 15.10 of the City of Orinda Code of Ordinance (City of Orinda 2022) requires the recycling or salvage for reuse of a minimum of 65 percent of nonhazardous construction and demolition waste.

Alameda County

Alameda County's 2003 Green Building Ordinance requires that a minimum of 50 percent of construction and demolition debris at County projects be diverted from the landfill through recycling and reuse. Later in 2008, the County set a 75 percent waste diversion resolution for which the minimum percentage of debris to be diverted from a landfill is 75 percent (Alameda County Sustainability 2023; Alameda County Public Works 2021).

Alameda County has two recycling ordinances that are mandatory (Alameda County Waste Management Authority 2023). The mandatory recycling ordinance (2012-01) requires all businesses and institutions, and multi-family properties with five or more units, to sort recyclables. The plant debris landfill ban ordinance (2008-01) prohibits disposal of plant debris in Alameda County landfills. This applies to any person or organization generating a significant amount of plant debris.

City of Oakland

Section 15.34.010 through Section 15.34.090 of Ordinance No. 13672, known as the City of Oakland Construction and Demolition Debris Collection, Transportation, Waste Reduction, and Recycling Requirements (City of Oakland 2021), requires that applicants for construction permits recycle and/or reuse 100 percent of asphalt and concrete and recycle 65 percent of the remaining material generated. All plant and tree debris will be separated from the other material and 100 percent of the plant and tree material will be composted.

City of Piedmont

The City of Piedmont's Construction and Demolition Debris Ordinance (as defined in the Green Building Standards of Chapter 5 of the Municipal Code) states that newly constructed residential buildings; projects increasing a building's conditioned area, volume, or size; or projects having a building permit valuation greater than or equal to $50,000 are required to divert at least 65 percent of the debris generated by the project from going to a landfill. This includes all construction, demolition, and renovation projects within the City (City of Piedmont 2023b).

5.19.3 Impact Questions

The project's potential effects on utilities and service systems were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.19-2 and discussed in more detail in Section 5.19.4.

Table 5.19-2. CEQA Checklist for Utilities and Service Systems

Would the Project		Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	☒
c)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d)	Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

5.19.3.1 Additional CEQA Impact Questions

The project's potential effects on recreational resources also were evaluated using the CPUC's Additional CEQA Impact Questions for Recreation in the *Guidelines for Energy Project Applications*

Requiring CEQA Compliance: Pre-filing and Proponent's Environmental Assessments (CPUC 2019). These additional impact questions are evaluated using the significance criteria set forth in the CPUC CEQA Guidelines. The conclusions are summarized in Table 5.19-3 and discussed in more detail in Section 5.19.4.

Table 5.19-3. Additional CEQA Impact Questions for Utilities and Service Systems

Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Would the project increase the rate of corrosion of adjacent utility lines as a result of alternating current impacts?	☐	☐	☐	☒

5.19.4 Potential Impact Analysis

Project impacts related to utilities and service systems were evaluated against the CEQA significance criteria and are discussed in the following subsections. The impact analysis evaluates potential project impacts during the construction phase and the operation and maintenance phase.

5.19.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "… a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on utilities and service systems was evaluated for each of the criteria listed in Table 5.19-2, as discussed in Section 5.19.4.3.

5.19.4.2 Applicant-Proposed Measures

The project will have a less-than-significant impact on utilities and service systems and no utility APMs are included.

5.19.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures, and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project operation and maintenance will be conducted with existing staffing using existing access.

a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? *Less-than-Significant Impact.*

The construction workforce will be relatively small (up to a daily average of approximately 62 workers, with an estimated peak project workforce of 117), so minimal water use and wastewater generation will occur. Wastewater service will be provided by portable toilets, and waste will be disposed of at appropriately licensed offsite facilities. This use will be temporary and short term and will not require construction of new water and wastewater treatment facilities. There are no known wells within the existing structure alignment or within city streets that are in the project area. Wells will not need to be relocated as part of the proposed project. The project will not require new or expanded water or wastewater treatment facilities, and existing water and wastewater facilities are sufficient to serve project needs. Therefore, no impact will occur.

The project will involve upgrading existing PG&E 115 kV power lines, which will not require stormwater drainage facilities. During construction, existing stormwater containment facilities, along with construction erosion and sediment control through implementation of a Stormwater Pollution Prevention Plan, will minimize construction impacts on surface water quality, as well as reduce the potential for stormwater to impact adjacent properties. No change to or expansion of stormwater drainage will occur during operation and maintenance of PG&E project components; no impact will occur.

The project will not require the construction of new or expanded natural gas or public telecommunications facilities. The project will not require relocation and construction of new or expanded electric utility facilities outside its scope. As required by state law, PG&E will notify other utility companies to locate and mark existing underground structures at proposed work areas prior to any ground-disturbing activities. No impact will occur.

Existing overhead and underground lines in the project area, including EBMUD, city utility, AT&T, Xfinity by Comcast, Sonic, and PG&E, are not known to conflict with the preliminary design of the proposed project. Construction of the western portion of the project where overhead lines will transition to underground lines may result in relocation of some existing utility infrastructure under Estates Drive, Park Boulevard, or Park Boulevard Way. Any relocation will be completed during project construction in coordination with the utility owner as described in Section 3.5.4.2. Although project construction may require the relocation of underground facilities, the relocation will be within the same roadway within franchise rights. Third-party telecommunication antennas located on two existing tower structures will be relocated to adjacent rebuilt structures or to another third-party location.

At the current stage of design, no active utility conflicts with underground utilities and no necessary relocations have been identified. However, as design advances, a need for relocation may be identified. If that occurs, relocation activities of the underground utilities will be coordinated with the utility owner to avoid or minimize service interruptions. In additional to potential relocation, a planned service interruption may be coordinated with the utility owner, or PG&E will coordinate with its gas or electric customers. During conductor installation or removal, existing PG&E overhead power or distribution lines or third-party telecommunication lines that cross the project's power lines will be taken out of service as needed for safety. Overhead distribution lines or third-party communication lines may need to be temporarily relocated to allow safe operation of construction equipment during certain activities such as vault installation using a crane, depending on field conditions at the time of the construction activity. No outage locations are known at this time. If distribution power line outages are required, they will be planned and electrical power customers will be notified in advance of planned outages. Distribution line clearances typically are scheduled for up to 8 hours. However, power will be restored as soon as it is safe to do so. Work near power lines is done safely when a qualified monitor directs the activity, and protective equipment is used when feasible to protect the workers from an electric shock hazard of an energized line. Typically, it is safer to take a line clearance to avoid the potential hazard of working near an energized line. A similar process will be implemented by PG&E in coordination with its gas customers or with other utilities should service interruption be required for construction safety or utility relocation. Service interruptions will be planned as part of the construction work plan at the location. PG&E will provide advanced notice to its customers before taking an outage. If the work involves relocating a third party utility, PG&E will coordinate and discuss the relocation to identify where work will occur, where the utility will be relocated, and any expected service interruption. Prior to the temporary disruption to services, users will be notified ahead of construction activities.

Any utility relocation will not cause significant environmental effects, with the work occurring within roadways or the facilities being attached to a similar aboveground powerline structure. A less-than-significant impact will occur with any facility relocation.

The project's operation and maintenance are not known to require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. No impact will occur.

b) Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years? *No Impact.*

The project does not require a water supply assessment as defined in California Water Code Section 10912. As noted in Section 5.19.2.2, industrial projects are required to prepare a water supply assessment if the project site is planned to house more than 1,000 persons, occupy more than 40 acres of land, or have more than 650,000 square feet of floor area or otherwise demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. The project does not house any new employees or residents or include any building floor area. The project is a rebuild of existing power lines; all aboveground replacement structures will be within existing PG&E right-of-way, except for two structures (RS27A/B) for which PG&E will add to existing easements. The project's operational water use for cleaning power lines will decrease because the length of overhead rebuilt line will be approximately 20 percent less than the existing length, resulting in a corresponding reduction in water used for cleaning. This is a result of the approximately 1 mile of westernmost existing overhead power lines that will be rebuilt underground.

The primary need for water will be for construction-related dust control activities, and recycled water will be used if feasible. Potable water will be supplied to PG&E construction workers for drinking and will be delivered to PG&E work areas by construction vehicles and equipment. Water trucks used for dust control during construction have a capacity of approximately 4,000 gallons of water. Up to two trucks, for a total of 8,000 gallons of water, will be used at a time during the peak periods of construction when ground disturbance may be occurring at the structure locations or along access improvements. However, the total volume available within the trucks onsite is not expected to be used daily. Water use will vary with the type of activities (increased use when activity is ground disturbing) and with other daily site conditions such as wind speed. Water for construction will come from EBMUD, either through municipal sources near the project or from the EBMUD treatment plant recycled water.

As discussed in Section 5.19.1.5, EBMUD can supply up to 325 mgd of water. The current demand for water is 238 mgd, with a projected 297 mgd by the year 2050. This demand for water is still below the capacity EBMUD can supply. Additionally, EBMUD can provide 9 mgd of recycled water for irrigation and non-potable consumption in its service territory. The minimal water needed for dust control and construction crew consumption will not exceed available supplies. Existing offsite water entitlements and resources will be sufficient to accommodate the project's minor temporary and short-term water needs and small number of construction workers. The available water supplies should be able to support project construction through several dry years. No impact will occur.

PG&E operation and maintenance visits will be conducted occasionally, and insulator washing is the only known activity that will require water. No change will occur from existing practices other than an approximately 20 percent reduction in overhead facilities and corresponding reduction in water use for insulator washing. Therefore, no operations or maintenance impact to water supply will occur.

c) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? *No Impact.*

The construction workforce will be relatively small, up to a daily average of approximately 62 workers and an estimated peak project workforce of 117, so minimal water use and wastewater generation will occur. Portable toilets will be provided for construction workers during construction. Sanitary waste will be maintained by a licensed sanitation contractor, and the licensed contractor will dispose of it at an offsite location at the closest feasible wastewater treatment district facility. This temporary and short-term use will not require expansion of existing water and wastewater treatment facilities or construction of new facilities. Therefore, no impact will occur.

Some equipment is planned to be replaced in the existing PG&E substations with no change to operational activity and, therefore, operations and maintenance will have no impact.

d) Would the project generate solid waste more than state or local standards, or more than the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? *Less-than-Significant Impact*.

The types and quantities of solid waste expected to be generated by project construction are described in Section 3.5.12.1. Of the existing 75 structures, 45 will be replaced, 8 that have been recently replaced will be reused with modifications, and 22 will be removed. Approximately 20 miles of existing conductor will be removed with approximately 15 miles replaced overhead and about 5 miles replaced in an underground alignment. The towers will be partially disassembled by hand with removal of structure components by crane to waste bins or trucks for hauling away. The construction crew will hand dig 3 feet with jack hammers to remove foundations when necessary. Materials removed will be placed directly into trucks and will be removed from the area and disposed of offsite at an appropriate landfill. When possible, various waste materials generated during construction will be recycled and salvaged. Construction debris will be picked up regularly from construction areas and stored in approved containers onsite; the debris will be hauled away for recycling or disposal periodically during construction. Hazardous waste will be transported per applicable regulations to an appropriate facility for disposal. The waste generated by the project will not generate solid waste more than state standards or local capacity, or otherwise impair solid waste reduction goals. The amount of waste generated by the project should have a no impact on the environment.

The project also will generate minimal solid waste from the food, glass, paper, plastic, and packing materials consumed by the up to average of approximately 62 construction workers who will be onsite daily during construction. Existing landfills in the project area have adequate capacity to accommodate this negligible amount of solid waste. No impact will occur.

PG&E operation and maintenance activities will be the same as current operation and maintenance activities, so no change in the amount of solid waste generated during these activities will occur. Therefore, no operations and maintenance impact to landfill capacity will occur.

e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste? *No Impact*.

PG&E will manage solid waste generated during construction and maintenance and operation by hauling to appropriate landfills with sufficient capacity as described previously. PG&E will reuse and recycle to divert debris from landfill disposal where reasonably feasible. As discussed in Section 5.3, Air Quality, Section 5.7, Geology and Soils, and Section 5.9, Hazards and Hazardous Materials, project construction has the potential to encounter NOA during earth-disturbing activities. In the event NOA is encountered, any NOA-contaminated soils excavated during construction will be hauled offsite and disposed of at a state-approved Class II or III asbestos disposal facility that meets the requirements of Public Resources Code Section 44820 and CA HSC Section 25173.7. PG&E or its designated and licensed hauler will apply for an Industrial Waste Hauler Permit(s) as needed. PG&E will comply with all applicable federal, state, and local statutes and regulations related to solid waste. Therefore, no impact will occur.

5.19.4.4 Additional CEQA Impact Questions

a) Would the project increase the rate of corrosion of adjacent utility lines as a result of alternating current impacts? *No Impact*.

An increase in corrosion rate can occur with adjacent circuits through inductance, especially with direct current circuits. While inductance is not likely with this project given the type of circuit, there are circumstances where stray alternating current can cause an increase in corrosion rate. The adjacent alternating circuit lines are insulated from one another, which prevents an increase in corrosion rate. Any resulting stray alternating current from an adjacent circuit is expected to follow an alternative path rather than to another insulated line.

PG&E has performed subsurface utility surveys and will continue to identify utilities prior to final design. PG&E will evaluate the proximity of utilities and potential for induced current and corrosion and, in coordination with the utility system owner, will determine whether steps are necessary to reduce the potential to induce current or cause corrosion. PG&E's final design will minimize any potential effects through measures such as increased cathodic protection or utility relocation in coordination with other utility owners as appropriate. There are no known adjacent utility lines to which the PG&E project components will contribute an increased rate of corrosion as a result of alternating currents during construction, operation, or maintenance. There will be no impact from the project on the rate of corrosion pertaining to adjacent utility lines.

5.19.4.5 CPUC Draft Environmental Measures

Refer to Section 3.5.4.2 for discussion of notification of utilities as identified in CPUC Draft Environmental Measure, Notify Utilities with Facilities Above and Below Ground.

5.20 Wildfire

This section describes existing conditions and potential impacts related to wildfire as a result of construction, operation, and maintenance of the project. The analysis concludes that any impacts related to wildfire hazards and hazardous materials will be less than significant. The project's potential effects associated with wildfire were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The conclusions are summarized in Table 5.20-4 and discussed in more detail in Section 5.20.4.

5.20.1 Methodology and Environmental Setting

The potential for the project's activities and equipment to pose wildfire hazards was evaluated by reviewing the following:

- Fire hazard maps, fire occurrence maps, and geographic information systems data from CAL FIRE and the CPUC
- Information provided in the Safety Elements and the Public Facilities/Services Elements of the *Contra Costa County General Plan*, *City of Oakland General Plan*, *City of Orinda General Plan*, and *City of Piedmont General Plan*
- CPUC and PG&E fire hazard rules and policies, including the current Wildfire Mitigation Plan (WMP)
- Contra Costa County, City of Oakland, City of Orinda, and City of Piedmont emergency plans and evacuation routes

The proposed project will be within the City of Orinda, unincorporated areas of Contra Costa County, and the cities of Oakland and Piedmont within Alameda County. The project spans approximately 5 miles, starting in the City of Orinda at Moraga Substation and concluding at Oakland X Substation in the City of Oakland. The topography in the area includes rolling hills, vegetated canyons, and higher elevations in the eastern and central portions of the project. A more gradual slope with less topographical variation occurs in the western portion of the project. Project elevation ranges from approximately 650 feet above mean sea level (amsl) at Moraga Substation to approximately 1,370 feet amsl when the lines crest the Oakland Hills and then dropping to approximately 140 feet amsl at Oakland X Substation.

Fire protection services and equipment relevant to this project are discussed in detail in this PEA in Section 5.15, Public Services.

5.20.1.1 High Fire Risk Areas and State Responsibility Areas

The CAL FIRE FHSZ maps identify locations that are within a Federal Responsibility Area (FRA), State Responsibility Area (SRA), or Local Responsibility Area (LRA) for preventing or suppressing fires. Within SRAs, the Director of CAL FIRE has designated areas as moderate, high, and very high FHSZs based on factors such as potential fuel sources, terrain, weather, fire behavior characteristics, burn probabilities, and the likelihood of vegetation exposure. Within LRAs, CAL FIRE has recommended areas that should be considered as very high FHSZs; these recommendations may or may not be adopted by local governing agencies.

Between November 21, 2022, and June 15, 2023, CAL FIRE made changes to the fire hazard severity designation in specific SRAs around California. In the Bay Area, this included changing the designation of some SRAs in the East Bay Hills, including in Contra Costa County near the project, from high to very high; additional updates are expected in 2024 (OSFM 2023).

The project vicinity includes both LRAs and SRAs as shown on Figure 5.20-1 (CAL FIRE 2023a). The project area within Contra Costa County (primarily the eastern section of the project) includes a very high FHSZ in an LRA for approximately one span of the project lines just west of the Moraga Substation property and a very high FHSZ in an SRA for the remainder of the lines to the Alameda County border (CAL FIRE 2023a, 2023b). In Alameda County, the central section and the eastern half of the western section of the project are in a very high FHSZ in an LRA; the remainder of the western section is primarily in areas with no FHSZ designations (CAL FIRE 2023a). Of the approximately 5.0-mile-long project alignment, approximately 1.2 miles are within the very high FHSZ designation in an SRA, and approximately 2.4 miles of the overhead and 0.4 mile of the underground alignment are within the very high FHSZ designation in an LRA. Approximately 0.4 mile of the existing overhead and approximately 0.8 mile of the underground portion are in areas with no designated FHSZ.

The CPUC has adopted fire hazard mapping most recently with its High Fire-Threat Map in 2021, which designates fire-threat areas that require enhanced fire safety. CPUC defines Zone 1 as the Tier 1 high-hazard zones (HHZs) from the U.S. Forest Service and CAL FIRE joint map of tree mortality HHZs. Tier 2 HFTD identifies areas with an elevated risk of wildfire associated with overhead utility power lines or overhead utility power line facilities also supporting communication facilities. Tier 3 HFTD identifies areas where there is an extreme risk from wildfires associated with overhead utility power lines or overhead utility power line facilities also supporting communication facilities (CPUC 2022). Approximately 1 mile of the existing 5-mile alignment is within a Tier 2 HFTD, and approximately 3 miles is within a Tier 3 HFTD (CPUC 2021). The westernmost approximately 1 mile of the alignment is not in an HFTD. The HFTDs in the project vicinity are shown on Figure 5.20-2.

The Wildland Urban Interface (WUI) is the zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Communities adjacent to and surrounded by wildland are at varying degrees of risk from wildfires (U.S. Fire Administration 2022). A major contribution to the severity and devastating outcomes of many WUI fires stems from the domino effect of fires spreading from the wildlands to deeper within the built community. Within a built community fires can spread from structure to structure. In the case of most destructive WUI fires, fire spread also is compounded by high winds and structures burning unmitigated by suppression actions (Maranghides 2021). WUI definitions may include reference to one or more housing density classes, as follows:

- Class 1 – Less than 1 house per 20 acres
- Class 2 – 1 house per 20 acres to 1 house per 5 acres
- Class 3 – More than 1 house per 5 acres to 1 house per acre
- Class 4 – More than 1 house per acre

Three types of WUI are identified by CAL FIRE: Urban Interface, Urban Intermix, and Wildfire Influence Zone (CAL FIRE 2019). Urban Interface is defined as dense housing adjacent to vegetation that can burn in a wildfire; it must meet the following landscape criteria identified by CAL FIRE:

- Housing density Class 2, 3, or 4
- In moderate, high, or very high FHSZ
- Not dominated by wildland vegetation (lifeforms not herbaceous, hardwood, conifer, or shrub)

Urban Intermix is defined as housing development interspersed in an area dominated by wildland vegetation subject to wildfire; it must meet the following landscape criteria identified by CAL FIRE:

- Not in Urban Interface
- Housing density Class 2
- Housing density Class 3 or 4 dominated by wildland vegetation
- In moderate, high, or very-high FHSZ
- Improved parcels only

Wildfire Influence Zone is defined as wildfire-susceptible vegetation; it must meet this criterion identified by CAL FIRE:

- Wildland vegetation up to 1.5 miles from Urban Interface or Urban Intermix

The WUI types along the project alignment can be found on Figure 5.20-3. Approximately 2.5 miles of the project is within the WUI Wildfire Influence Zone in the eastern and central sections. Approximately 1.7 miles and approximately 0.3 mile of the project is within the WUI Urban Interface and WUI Urban Intermix areas in the central and western sections, respectively. The western end of the western section, approximately 0.6 mile, is not part of a WUI.

5.20.1.2 Fire Occurrence

Fire history is a vital component in understanding fire frequency, fire type, significant ignition sources, and vulnerable areas. The topography, vegetation, and climatic conditions associated with the Oakland Hills combine to create a unique situation capable of supporting large-scale, high-intensity, and sometimes damaging wildfires.

Factors Affecting Fire Occurrence

Nearly all significant wildfires in the Oakland Hills have burned in the months of September to November. This period coincides with the end of the dry summer season, where vegetation has lower fuel moisture and Diablo winds return to the area. While not all the fires were associated with Diablo (easterly or northeasterly) winds, the largest and most damaging fires have occurred during such winds. The history of wildfire ignitions in the area are directly related to human activity. Notable ignition locations include view spots along Grizzly Peak Boulevard or Skyline Boulevard that offer views of the San Francisco Bay and congregation areas within Joaquin Miller Park, along Skyline Boulevard near Sequoia Point. Stolen vehicle dump sites are another potential wildfire ignition source, with notable locations in Joaquin Miller Park (near Sequoia Point) and at the water tank on Skyline Boulevard, approximately 0.5 mile west of its intersection with Grass Valley Road. Mechanized and power equipment use such as mowers on private residential parcels is another potential ignition source. In fact, this source was responsible for igniting the 1970 Diablo Fire, which burned approximately 204 acres after igniting near Buckingham Boulevard and Norfolk Road in Berkeley, approximately 2.3 miles from the project alignment (Oakland 2024). Fireworks present another potential ignition source in early summer on or near July 4, notably at King Estates Park (Crudele pers. comm. 2017; Oakland 2024). Other potential ignition sources include vehicle-originated fires along area roads, including SR 13 and SR 24 and Interstate (I) 580.

Fire History in the Project Vicinity

CPUC Guidelines state that a PEA should identify all large fires within the last 10 years that have occurred within the project vicinity; however, a definition of "large fire" is not provided. The National Wildfire Coordinating Group (NWCG), a federal government working group that coordinates wildfire term standardization, provides the following definition of a "large fire": "(1) A fire burning more than a specified area of land, [for example], 300 acres for statistical purposes, and (2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface" (NWCG 2022). PG&E's 2023-2025 WMP (2024) defines a "large fire" as "[a] fire that burns 300 or more acres but does not meet the definition of a Destructive or Catastrophic fire." A "destructive fire" is defined by PG&E as "[a] fire that destroys 100 or more structures but does not result in a serious injury or fatality." A "catastrophic fire" is defined by PG&E as a fire "that caused at least one death, damaged over 500 structures, or burned over 5,000 acres." Based on these criteria, 300 acres or greater was used to define a large fire.

Although it occurred more than 10 years ago, the 1991 Tunnel Fire is a well-known, large wildfire in the Berkeley-Oakland Hills that meets the PG&E definition of a catastrophic fire because it caused 25 deaths and damaged more than 3,000 structures. It was ignited by an unknown source on a residential hillside behind 7151 Buckingham Boulevard in Berkeley, which is approximately 2.4 miles north of the project alignment. The Tunnel Fire burned approximately 1,700 acres as it moved south across SR 24 into Berkeley and Oakland neighborhoods (FEMA 1992 and Oakland 2024).

CAL FIRE's incident-reporting data goes back to 2013, and records for each year starting with 2013 were reviewed. According to CAL FIRE incident reporting, within the past 10 years, no wildfire incidents greater than 300 acres were reported within 5 miles of the project (CAL FIRE 2024). The CAL FIRE incidents within 5 miles of the project site in the last 10 years smaller than 300 acres involved six fires between approximately 15 acres and 45 acres; no ignition source is stated for any of them (CAL FIRE 2024). These fires are described briefly as follows:

- The Fish Fire in 2017 burned approximately 20 acres near the intersection of SR 24 and Fish Ranch Road, which is approximately 0.5 mile north of a potential staging area and 2.3 miles from project work areas.
- In 2017, the Edwards Fire burned approximately 22 acres near the intersection of Edwards Avenue and Mountain Boulevard, which is approximately 3.7 miles south of the project alignment.
- In 2018, the Buckingham Fire burned approximately 45 acres near Buckingham Boulevard and Morgan Road in Moraga, which is approximately 2.4 miles east of Moraga Substation.
- In 2019, the Merrill Fire burned approximately 40 acres near Merrill Circle North and Merrill Drive in Moraga, which is approximately 3.2 miles south of Moraga Substation.
- In 2020, the Irvine Fire burned approximately 30 acres near Irvine Drive in Moraga, which is approximately 3.5 miles south of Moraga Substation.
- In 2024, the Keller Fire burned approximately 15 acres after igniting near a residence on Sanford Street at Keller Avenue in Oakland, which is approximately 4.3 miles south of the project alignment.

5.20.1.3 Fire Risk

Fire risk factors include topography, vegetation types, and weather. Information on vegetation types and weather for the project area is presented in the following subsections. PG&E used its Wildfire Transmission Risk Model (WTRM) to estimate wildfire risk with the implementation of the proposed project. This section presents data on local vegetation types and weather, as well as a description of the WTRM and how the modeling was conducted.

Topography

Much of the project is in the East Bay Hills, the steep coastal mountains to the east of the San Francisco Bay. The hillslopes and canyons of the East Bay Hills meet the Bay plain to the west and slope upward to the northwest-southeast-oriented ridgeline to the east. The lowest elevations in the very high FHSZ crossed by the project are approximately 70 feet amsl at the bottoms of Arroyo Viejo and San Leandro Creek. The highest elevations are in the northern portion of the very high FHSZ at approximately 1,500 feet amsl near Grizzly Peak. The elevations in the vicinity of the eastern and central sections of the project are shown on Figure 5.20-4. The northwest-southeast trending ridges and valleys that the project alignment crosses are visible on the figure. In the western section, the topography flattens as it slopes toward San Francisco Bay; this highly urbanized section of the project is not included in the topography figure.

The very high FHSZ associated with the project is characterized by multiple drainages that run generally east to west, or northeast to southwest, downward from the summit ridgeline that roughly parallels Grizzly Peak Boulevard and Skyline Drive. Listed in general north to south order, prominent watersheds and drainages in the vicinity of the project include Claremont Canyon, Temescal Creek, Shephard Creek, Palo Seco Creek, Sausal Creek, Horseshoe Creek, Rifle Range Branch, Country Club Creek, Arroyo Viejo, Grass Valley Creek, and San Leandro Creek. The creeks in the very high FHSZ generally converge into a few larger creeks in the lower Bay plain region, ultimately reaching the San Francisco Bay. Shephard Creek, in Shepherd Canyon Park, forms a southwest-northeast drainage that crosses the project alignment. The steepest slopes in the very high FHSZ have gradients up to 62 degrees, although most of the area has slope gradients of less than 27 degrees, and the mean slope gradient for the area is

16 degrees (USGS 2013a, 2013b). Figure 5.20-5 shows slopes in the vicinity of the central and western sections of the project, as used in PG&E's WTRM.

Topography affects wildfire movement and spread. Steep terrain typically results in faster upslope fire spread from preheating of uphill vegetation. Flatter areas typically result in slower fire spread, absent windy conditions. Topographic features such as saddles, canyons, and chimneys (land formations that collect and funnel heated air upward along a slope) may form unique circulation conditions that concentrate winds and funnel or accelerate fire spread. For example, fire normally moves more slowly downslope than upslope. Terrain also may buffer, shelter, or redirect winds away from some areas based on canyons or formations on the landscape. Saddles occurring at the top of drainages or ridgelines may facilitate the migration of wildfire from one canyon to the next.

Within the East Bay Hills, the narrow drainage and subdrainage topographic features of the Oakland Hills have the capability to funnel winds, increase wind speeds, erratically alter wind direction, facilitate fire spread, and promote extreme fire behavior. This is especially true during Diablo wind events, when strong easterly or northeasterly winds are aligned with the downslope direction of the canyons and watersheds of the Oakland Hills. The topography of the Oakland Hills is, therefore, capable of producing wind conditions that promote extreme wildfire behavior.

All slope aspects (the compass orientation of a slope) are represented in the very high FHSZ, with a higher proportion of south-, southwest-, and west-facing slopes present. The effect of aspect on fire hazard is related to solar exposure. South and west-facing slopes are subject to more thermal heating from the sun and consequently have higher temperatures and lower fuel moisture. These slope aspects typically are dominated by lighter fuels (for example, brush, grasses). North- and east-facing slopes receive less solar exposure and are, therefore, cooler and typically have heavier fuel loads (for example, trees).

Vegetation Types

The vegetation communities and associated fuel models (NWCG 2024) used in the WTRM consist of the following:

- Annual Grassland (short, sparse dry climate grass [GR1], low load dry climate grass [GR2], and moderate load dry climate grass [GR4])
- Chamise-Redshank Chaparral (high load dry climate shrub [SH5] and high load humid climate shrub [SH8])
- Coast Oak Woodland (GR1, moderate load dry climate grass-shrub [GS2], light load dry climate tinder-grass-shrub [TU1], low load broadleaf litter [TL2])
- Coastal Scrub (GR1, low load dry climate grass-shrub [GS1], GS2, low load dry climate shrub [SH1], SH5)
- Closed-Cone Pine-Cypress (SH5, TU1, very high load dry climate timber-shrub [TU5], TL2, moderate load conifer litter [TL3], moderate load broadleaf litter [TL6])
- Eucalyptus (GR1, SH5, TU1, TU5, TL2, TL3, TL6, very high load broadleaf litter [TL9])
- Freshwater Emergent Wetland (non-burnable fuel – land covered by urban and suburban development [NB1])
- Perennial Grassland (GR1)
- Redwood (TU1, TL3)
- Valley/Foothill Riparian (SH1, TU5)
- Urban (Developed) (GR1, NB1)
- Urban (Acacia) (TU1)

- Urban (Mixed Tree Stand) (GR1)

A map of the fuel models in the vicinity of the project is presented on Figure 5.20-6 for the eastern and central sections of the project. Within the eastern and central sections, the predominant fuel types are NB1 (urban [developed]) at 28 percent, TL6 (closed-cone pine-cypress with moderate load broadleaf litter) at 23 percent, and TL3 (redwood) at 14 percent. NB1 fuel models are considered to not support wildland fire spread. The primary carrier of fire in the TL fuel models is dead and down woody fuel; live fuel, if present, has little effect on fire behavior. TL3 fuel models are identified as having very low spread rate and low flame length; TL6 fuel models are identified as having moderate spread rate and low flame length (NWCG 2024).

Weather Data

This subsection discusses wind direction and speed, relative humidity, and temperature in the project area and how those conditions influence fire risk. Hourly weather data for the period from October 2014 to October 2024 was obtained from a National Weather Service remote automated weather station, the Oakland North weather station (ONOC1), located approximately 2.6 miles northwest of the project alignment at latitude 37.8650 and longitude -122.220830 and elevation 1,403.0 feet amsl. The weather station is monitored by the University of Utah. The 10 years of data were analyzed to determine, for each month, the prevailing wind direction, average daily maximum wind speed, average and peak daily high temperatures, and average minimum and low relative humidity. These data are presented in Table 5.20-1.

In addition, data from two other weather stations were reviewed and evaluated. One weather station is in Orinda near Moraga Substation at latitude 37.85111 and longitude -122.15500 with an elevation of 738 feet amsl; data between November 2009 and March 2024 were reviewed. The other weather station is at the Oakland Museum of California at latitude 37.79810 and longitude -122.26343 with an elevation of 30 feet amsl; data between November 1970 and March 2024 were reviewed.

The eastern section of the project typically is warmer than the central and western sections, which are cooler from being nearer to the San Francisco Bay. In the East Bay Hills at approximately 700 to 800 feet amsl, temperatures are slightly less influenced by the San Francisco Bay but are still highly influenced by onshore flow versus offshore flow. The average high temperature for the eastern section of the project drops to its lowest in December at an average of 55.6 degrees Fahrenheit (°F). High temperatures then reach their highest in September at an average of 80.9°F. The annual average daily temperature is 60.2°F. The annual average precipitation is 31.43 inches. The month with the most rainy days on average is December (seven days) and the months with the fewest rainy days are June through September (0 days) (Synoptic Data 2024).

Areas near the San Francisco Bay and near sea level will see temperatures that are highly influenced by the water temperature and whether the area is experiencing onshore flow versus offshore flow. Onshore flow is typical and air flows from the water over the land, cooling temperatures during the afternoons and evenings. Offshore flow causes increasing temperatures because air flowing from the land toward the water can sometimes not allow for as much cooling during the overnights. The average high temperature for the western and central sections of the project drops to its lowest in December at an average of 58.5°F. High temperatures then reach their highest in September at an average of 75.0°F. The annual average daily temperature is 59.3°F. The annual average precipitation is 22.57 inches. The months with the highest number of rainy days on average are January and February (17 days) and the month with the fewest rainy days is July (0 days) (WRCC 2024).

Table 5.20-1. Summary of Weather Data from Station ONOC1 2014-2024

Month	Predominant Wind Direction	Wind Speed (mph)		Relative Humidity (percent)		Temperature (°F)	
		Average Max.	Monthly Peak	Average Min.	Monthly Low	Average High	Monthly Peak
January	NE	28.5	34	22.8	10	64.3	72
February	NE	26.9	35	19.7	8	68	74
March	SSW	24.5	32	17.5	10	73.3	81
April	SSW	22.3	27	17.5	9	80.4	87
May	SSW	21.1	28	19.3	8	83.1	90
June	SSW	17.6	23	18.6	9	93.1	97
July	SSW	16.3	19	17.4	10	91.3	99
August	SSW	15.8	19	14.6	6	93.7	101
September	SSW	18.8	25	19.72	5	96.1	108
October	SSW	26.1	35	10.81	3	89.93	103
November	NE	25.0	29	20.18	7	74.2	81
December	NE	25.7	32	25.4	13	61.6	69

mph = mile(s) per hour

Risk Model

PG&E's WTRM was used to analyze wildfire risk. The WTRM is outlined in more detail in Section 6 of PG&E's *2023-2025 Wildfire Mitigation Plan* (PG&E 2024). The WTRM assesses risk based on probability of equipment or asset failure, which, for the purposes of this project, is the probability of failure of power line structures. Risk is calculated as the product of the probability of an event associated with a risk driver and the potential consequences from that event. Risk consequences are potential impacts that will result if the risk event was to occur. Consequences include safety, reliability, and financial attributes. Each structure has a consequence value based on the structure attributes and its potential for failure.

WTRM uses weather data sourced from PG&E meteorology to generate the probability of failure and incorporates vegetation as one of the drivers of wildfire risk. Information on topography is incorporated through the wildfire consequence modeling to generate the final wildfire risk value.

The structures across the Moraga–Oakland X 115 kV lines included in the project alignment were divided into three categories depending on the action being taken on each structure. The categories were "no change" if the existing structure will be retained as is, "new structure" if it will be replaced by a new structure, and "removal" if the structure will be removed or undergrounded. These three scenarios were then run through the WTRM to get a current and post project Wildfire Risk value. The total Wildfire Risk reduction gained from the project is calculated by summing the change in Wildfire Risk across all structures.

The project includes 75 structures along the two power lines, of which 6 will be retained, 21 will be removed and rebuilt underground, and 48 will be replaced with new structures. In addition, 3 new proposed light-duty steel pole transition structures are part of the project. For each of the 48 replaced structures and 3 new transition structures, the WTRM was used to calculate the updated post-construction wildfire risk value.

To calculate the post project wildfire risk for structures that will be replaced with new structures, key input parameters to the WTRM were replaced to reflect the attributes of the replacement structures. The attributes that were considered for updating include the following:

- The structure's age was set to zero to indicate it will be a new structure.

- The inspection condition code was set to one to indicate that the new structure will not have any deficiencies that could lead to a failure.
- The value of the strength ratio was carried over from the existing structure with the assumption that the new structure will be built to the same specifications as the existing structure. The over-strength ratio is a measure of how much mechanical load a structure is designed to support when compared to the baseline wind load in the design code.
- The value of the atmospheric corrosion design life reduction factor was carried over from the existing structure with the assumption that the replacing structure will be built from the same materials as the existing structure and will be subject to the same atmospheric conditions as the existing one. Although some new structures may be of different materials than the structures they are replacing, the new structures will be equal to or better than the existing in terms of fire resistance.

The WTRM also uses other parameters to calculate the probability of failure based on factors such as wind and weather conditions in the location around the structure, historical outages on the lines, and a base fragility function for each structure. These parameters were not updated because they are independent of a specific structure and because the location of the new structure will be installed in the vicinity of the existing structure.

Based on the updated input parameters, the model was used to recalculate the annualized probability of failure for each replacement structure. The probability of failure was multiplied by the wildfire consequence value for each structure being replaced to calculate the new wildfire risk. The change in wildfire risk for each structure was summed across the project's 78 structures to calculate a total change in wildfire risk from the project. The PG&E WTRM estimates an approximately 90 percent reduction in wildfire risk from the project (refer to Table 5.20-2).

Table 5.20-2. Estimated Change in Wildfire Risk with Proposed Project Implementation

Existing Number[a b]	Replacement Number[a]	Project Scenario	Current Wildfire Risk[c]	Post Project Wildfire Risk[c]	Percent Change in Wildfire Risk
EN1	RN1	Replace structure	7.63E-05	1.98E-05	-74
EN2	RN2	Replace structure	7.63E-05	1.98E-05	-74
EN3	RN3	Replace structure	1.30E-04	6.36E-05	-51
EN4	RN4	Retain structure	1.25E-04	1.25E-04	0
EN5	RN5	Retain structure	1.92E-04	1.92E-04	0
EN6	RN6	Retain structure	1.93E-04	1.93E-04	0
EN7	RN7	Replace structure	5.09E-03	1.92E-04	-96
EN8	RN8	Replace structure	5.09E-03	1.92E-04	-96
EN9	RN9	Replace structure	1.65E-04	6.90E-05	-58
EN10	RN10	Replace structure	1.20E-03	6.90E-05	-94
EN11	N/A	Remove structure	7.01E-05	0.00E+00	-100
EN11A	N/A	Remove structure	2.14E-04	0.00E+00	-100
EN12	RN11	Replace structure	2.34E-03	6.90E-05	-97
EN13	RN12	Replace structure	6.93E-05	6.90E-05	0
EN14	RN13	Replace structure	8.63E-05	3.40E-05	-61
EN15	RN14	Replace structure	1.60E-04	3.40E-05	-79
EN16	RN15	Replace structure	8.63E-05	3.40E-05	-61
EN17	RN16	Replace structure	1.60E-04	3.40E-05	-79
EN17A	N/A	Remove structure	5.40E-05	0.00E+00	-100
EN18	RN17	Replace structure	1.60E-04	3.40E-05	-79

Existing Number[a b]	Replacement Number[a]	Project Scenario	Current Wildfire Risk[c]	Post Project Wildfire Risk[c]	Percent Change in Wildfire Risk
EN19	RN18	Retain structure	6.65E-05	3.41E-05	-49
EN20	N/A	Remove structure	1.87E-04	0.00E+00	-100
EN21	RN19	Replace structure	3.46E-04	3.40E-05	-90
EN22	RN20	Replace structure	1.95E-04	3.40E-05	-83
EN23	RN21	Replace structure	4.40E-05	2.95E-06	-93
EN24	RN22	Replace structure	2.36E-05	2.95E-06	-87
EN25	RN23	Replace structure	4.40E-05	2.95E-06	-93
EN26	RN24	Replace structure	4.40E-05	2.95E-06	-93
EN27	RN25	Replace structure	2.36E-05	2.95E-06	-87
EN28	RN26	Replace structure	2.36E-05	2.95E-06	-87
EN29	TN27A	Replace structure	9.59E-06	1.20E-06	-87
EN30	N/A	Remove structure	2.70E-06	0.00E+00	-100
EN31	N/A	Remove structure	2.70E-06	0.00E+00	-100
EN32	N/A	Remove structure	2.58E-05	0.00E+00	-100
EN33	N/A	Remove structure	2.70E-06	0.00E+00	-100
EN34	N/A	Remove structure	1.41E-06	0.00E+00	-100
EN35	N/A	Remove structure	1.41E-06	0.00E+00	-100
EN36	N/A	Remove structure	1.41E-06	0.00E+00	-100
EN37	N/A	Remove structure	4.88E-07	0.00E+00	-100
ES1	RS1	Replace structure	3.19E-05	2.08E-05	-35
ES2	RS2	Replace structure	6.09E-05	2.08E-05	-66
ES3	RS3	Replace structure	1.95E-04	6.67E-05	-66
ES5	RS4	Retain structure	5.14E-05	5.14E-05	0
ES6	RS5	Retain structure	4.20E-04	4.20E-04	0
ES7	RS6	Retain structure	2.00E-04	2.00E-04	0
ES8	RS7	Replace structure	5.24E-03	2.00E-04	-96
ES8A&B	N/A	Remove structure	3.66E-04	0.00E+00	-100
ES9	RS8	Replace structure	7.58E-04	2.00E-04	-74
ES10	RS9	Replace structure	2.42E-03	7.20E-05	-97
ES11	RS10	Replace structure	3.11E-04	7.20E-05	-77
ES12	N/A	Remove structure	3.50E-04	0.00E+00	-100
ES14	RS11	Replace structure	5.14E-04	7.20E-05	-86
ES15	RS12	Replace structure	3.11E-04	7.20E-05	-77
ES16	RS13	Replace structure	1.38E-03	3.56E-05	-97
ES17	RS14	Replace structure	1.38E-03	3.56E-05	-97
ES18	RS15	Replace structure	1.67E-04	3.56E-05	-79
ES19	RS16	Replace structure	9.01E-05	3.56E-05	-60
ES20	RS17	Replace structure	1.67E-04	3.56E-05	-79
ES21	RS18	Retain structure	6.94E-05	3.56E-05	-49
ES22	N/A	Remove structure	2.84E-04	0.00E+00	-100
ES23	RS19	Replace structure	3.60E-04	3.56E-05	-90

Existing Number[a b]	Replacement Number[a]	Project Scenario	Current Wildfire Risk[c]	Post Project Wildfire Risk[c]	Percent Change in Wildfire Risk
ES24	RS20	Replace structure	4.61E-05	3.11E-06	-93
ES25	RS21	Replace structure	4.61E-05	3.11E-06	-93
ES26	RS22	Replace structure	4.61E-05	3.11E-06	-93
ES27	RS23	Replace structure	4.61E-05	3.11E-06	-93
ES28	RS24	Replace structure	4.61E-05	3.11E-06	-93
ES29	RS25	Replace structure	4.61E-05	3.11E-06	-93
ES30	RS26	Replace structure	4.61E-05	3.11E-06	-93
ES31	TN27B	Replace structure	3.70E-05	5.00E-06	-86
ES32	N/A	Remove structure	2.84E-06	0.00E+00	-100
ES33	N/A	Remove structure	2.84E-06	0.00E+00	-100
ES35	N/A	Remove structure	2.84E-06	0.00E+00	-100
ES36	N/A	Remove structure	2.84E-06	0.00E+00	-100
ES37	N/A	Remove structure	2.84E-06	0.00E+00	-100
ES38	N/A	Remove structure	2.84E-06	0.00E+00	-100
N/A	TN28	Add Structure	n/a	1.44E-07	N/A
N/A	TN29	Add Structure	n/a	1.44E-07	N/A
N/A	TS28	Add Structure	n/a	1.53E-07	N/A
Total			**3.23E-02**	**3.31E-03**	**-90**

[a] Each structure is identified by its location on the northern line or southern line and as existing and rebuild; for example, existing northern 1 (EN1) and existing southern 1 (ES1) and rebuild northern 1 (RN1) and rebuild southern 1 (RS1). TN refers to new transition (riser) structures on the northern line and TS refers to new transition (riser) structures on the southern line.

[b] There is no existing structure ES4 or existing structure ES34.

[c] Wildfire Transmission Risk Model (WTRM) (PG&E 2024).

5.20.1.4 Values at Risk

The land uses within and surrounding the project area are discussed in Section 5.11, Land Use and shown on Figures 5.11-1 and 5.11-2. Population and housing estimates for the project area are provided in Section 5.14, Population and Housing. These communities include structures and other improvements, including PG&E infrastructure, that could potentially be at risk from wildfire. The wildfire vulnerability of these structures and improvements is typical for the area. Wildfire risk is dependent on the age of the structures and improvements and their physical siting. In addition to intrinsic value, identification of values at risk in the project area is informed by location within or near WUI zones, biological resources, communities, and other population centers.

The eastern section of the project progresses generally southwest and crosses through hilly open space and park land in the City of Orinda, unincorporated Contra Costa County, through an area mainly owned by EBRPD and EBMUD, to the top of the Oakland Hills. The trees and vegetation present are important to the existing uses of the area, which include recreation and open space. There is no rare habitat present in this section. The few structures in the eastern section include PG&E's Moraga Substation and the Moraga–Oakland X 115 kV power lines, maintenance buildings, and roadways. Approximately 100 primarily single-family residences and associated utilities, including aboveground electric distribution lines with a telecommunication underbuild on wood poles, are within 1,000 feet of Moraga Substation.

The central section of the project enters the City of Oakland, including the Montclair neighborhood, within Alameda County, where the land use changes to an area of predominantly residential uses with some park and recreational areas, including Shephard Creek and Shepherd Canyon Park. Approximately 1,550 structures – primarily single-family residences as well as commercial buildings, schools, and churches – are within 1,000 feet of the project footprint in this section, as are streetlights and overhead electric distribution lines with wood poles. A small number of traffic lights in the Montclair Village area, Oakland Fire Station No. 24, and the City of Oakland Municipal Service Yard, which contains vehicles and other equipment, also are within 1,000 feet of the project footprint.

The western section of the project is in the City of Oakland. The land use in this area includes parks and recreation along Sausal Creek and Dimond Canyon Boulevard and highly urbanized areas with a mix of residential, commercial, and other uses. Approximately 3,150 structures, primarily single-family and multi-family residences as well as commercial buildings, schools, and churches, are within 1,000 feet of the project footprint in this section, as are streetlights and overhead electric distribution lines with wood poles. Several traffic lights are along Park Boulevard.

5.20.1.5 Evacuation Routes

As described in Chapter 3, Project Description, work areas on local roads may require temporary lane or road closures of up to approximately 10 working days (2 calendar weeks), for work activities on surface streets. Work areas with anticipated temporary road closures are shown on Figure 3.5-1. When cranes are set up in a roadway, they are expected to be able to be set up to not block driveway access. Other than the footprint of a crane set up for construction for up to approximately 10 working days, work areas within roadways are anticipated to require temporary lane or road closure only during daily construction work hours. At the conclusion of a construction work day, a work area in a roadway will be demobilized and temporary lane or road closures will end. Other than four locations, temporary road closure locations will have ingress and egress available on both sides of the closures (refer to Table 5.20-3).

In four locations, such as at East Circle by proposed structures RN12 and RS12, the work area will occupy the end of a street with no secondary access, for example a court. Access to the residences at the end of these roads is expected to be maintained; however, vehicular access may be restricted and residents may need to park their cars on the road up to approximately 200 feet away. These residents will be offered the option of safe transport to and from their residence, per APM TRA-1. The other work areas shown on Figure 3.5-1 that may require temporary road closures have secondary access; egress options are available from either side of the work areas.

Table 5.20-3 lists work locations in the central and western sections of the project by existing and replacement structure numbers, the associated road that may be temporarily closed, alternate routes to provide ingress and egress, and the distance from the work area to the nearest intersection in both directions. One lane is expected to be maintained open on Park Boulevard between Leimert Boulevard and Estates Drive during installation of structures TS27A/TS27B, so these structures are not included in Table 5.20-3. During construction of the underground portion of the project in Park Boulevard, at least one lane each way will be maintained open, and the underground portion of the project also is not included in Table 5.20-3. Any closures required for installation of guard poles on residential roads will be brief, no more than a day, and are expected to maintain an open lane; these guard pole locations also are not included in Table 5.20-3.

Table 5.20-3. Access During Local Road Temporary Closures

Access/Work Area Structures	Temporary Road Closure	Alternative Route	Distance to Nearest Intersection
EN10/EN11/ EN11A/RN10/RS10	Manzanita Drive	Skyline Boulevard, Pinehurst Road, and Shepherd Canyon Road to the east; Skyline Boulevard, Scout Road, and Colton Boulevard to the west	0.22 mile to the east 0.84 mile to the west
EN12/ES13/ RN11/RS11	Skyline Boulevard	Manzanita Drive, Pinehurst Road, and Shepherd Canyon Road to the east; Manzanita Drive, Scout Road, and Colton Boulevard to the west	0.26 mile to the east 0.29 mile to the west

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Table 5.20-3. Access During Local Road Temporary Closures

Access/Work Area Structures	Temporary Road Closure	Alternative Route	Distance to Nearest Intersection
EN13/ES15/ RN12/RS/12	East Circle	N/A; no secondary vehicle access[a]	N/A
EN14/ES16/ RN13/RS13	Sayre Drive	Saroni Drive to the north (connecting to Shepherd Canyon Road and other roads); Saroni Drive to the south/west (connecting to Heartwood Drive/Snake Road and other roads)	0.2 mile to the north 0.3 mile to the south/west
EN15/ES17/ RN14/RS14	Saroni Court	N/A; no secondary vehicle access[a]	N/A
EN16/ES18/ RN15/RS15	Balboa Drive	Access through Paso Robles Drive from the north and Asilomar Drive from the west	0.02 miles to the north 0.56 miles to the west
EN17/ES19/ RN16/RS16	West Circle	N/A; no secondary vehicle access[a]	N/A
EN18/ES20/ RN17/RS17	Cortez Court	N/A; no secondary vehicle access[a]	N/A
EN20/ES24/ RN20/RS20	Scout Road	Access through Ascot Drive and Mountain Boulevard from the west	0.28 miles to the west 0.29 miles to the east
EN24/ES26/ RN22/RS22	Monterey Boulevard	Access through next highway exit for Lincoln Avenue	0.68 miles to the south 0.14 miles to the north
EN25/ES27/ RN23/RS23	Leimert Boulevard	Access through Bywood Drive from the east and Carter Street from the south	0.03 to the east 0.17 miles to the west
EN26/ES28/ RN24/RS24	Leimert Boulevard	Access through Carter Street from the north and Park Boulevard from the west	Immediately to the south 0.92 to the west
EN28/ES30/ RN26/RN26 (potential pull site)	Park Boulevard	Park Boulevard, Estates Drive, Liemert Boulevard to the south; Park Boulevard, Monterey Boulevard, and SR 13 to the north	0.01 mile to the south 0.54 mile to the north
EN30/ES32	Saint James Drive	Access Trestle Glen Road Access Park Boulevard	0.09 miles to the east 0.56 miles to the west
EN31/EN32/ES33	Glendome Circle	Access from Hollywood Avenue Access from El Centro Avenue	0.01 mile to the south 0.15 mile to the south
EN33/ES34	Glendora Avenue	Access through El Centro Avenue from the north	0.03 miles to the east 0.12 miles to the south
EN34/ES35	Everett Avenue/ Wellington Street	Access to either side of roadway intersection	0.01 mile from to the east 0.01 mile from to the east
EN35/ES36	Holman Road	Access through Hampel Street from the east and Bates Road from the south	0.04 miles to the East 0.18 miles to the south
EN36/ES37	Bates Road	Access through Hampel Street from the east and Holman Road from the north	0.19 miles to the east 0.51 miles to the south
EN37/ES38	Holman Road	Access through Hampel Street from the east and Bates Road from the south	0.29 miles to the east 0.03 miles to the south
EN37/ES38	Bates Road	Access through Hampel Street from the east and Holman Road from the north	0.29 miles to the east 0.03 miles to the south

[a] Work area will occupy the end of a roadway with no secondary vehicle access, for example, a court.

N/A = not applicable

Larger roadways often serve as evacuation routes because they have multiple entry and exit points. Roadways with no secondary access that will restrict traffic to one entry or exit point generally do not serve as evacuation routes. Multiple interstates and highways, including I-580, I-880, I-980, SR 24, and SR 13, are in the vicinity of the project and could be used in an evacuation. Additional major roadways in the project vicinity that could be used in an evacuation are listed in the following subsections by jurisdiction.

Most of the local governments within the project area use Genasys Protect (previously known as Zonehaven Aware), which is an evacuation management platform that helps communities and first responders plan, communicate, and execute evacuations. Genasys Protect incorporates information provided by local emergency services. Communities are separated into zones and residents are able to look up their addresses to determine their zone. Each zone map will specify evacuation information relevant to the residents within that zone to simplify the evacuation planning process and increase emergency preparedness (Genasys 2023). Genasys identifies the specific evacuation routes and automatically sends road and zone closure information to Waze to support evacuations. As noted on the Genasys Protect website, evacuation routes are always incident-specific because the best route to take is always relative to the location and type of threat.

Contra Costa County Emergency Operations Plan and Evacuation Routes

Contra Costa County does not identify specific evacuation routes in its emergency operation plan (Contra Costa County 2005b, Contra Costa County 2018). Contra Costa County communicates evacuation information, including routes, using Genasys Protect as described previously. Within unincorporated Contra Costa County, the proposed project is within Genasys zones CCC-E156, CCC-E157, and CCC-E167 (Genasys 2023).

Although the County has not identified specific evacuation routes, major roadways in Contra Costa County near the project that could be used as potential evacuation routes include the following:

- SR 24 – An east/west running eight-lane highway that is approximately 2 miles to the north of the project and crosses both Alameda and Contra Costa Counties. As this highway goes east, it intersects with I-680 in Walnut Creek. There are multiple on-/off-ramps in the City of Orinda.
- I-680 – A north/south running eight-lane highway in eastern Contra Costa County that intersects with SR 24 in Walnut Creek.
- Pinehurst Road – A long two-lane road in unincorporated Contra Costa County that connects to Skyline Boulevard and Shepherd Canyon Road in Oakland and Canyon Road and Redwood Road in Unincorporated Contra Costa County.
- San Pablo Dam Road (turns into Camino Pablo Road) – This road runs from SR 24 to I-80 in San Pablo.

City of Orinda Evacuation Routes

The City of Orinda generally identifies SR 24 (refer to prior description) as the primary evacuation point for wildfire emergencies and provides an evacuation analysis that establishes possible emergency response protocol based on other natural hazards (City of Orinda 2023a). It does not otherwise identify specific evacuation routes in its emergency operations or General Plan (City of Orinda 2023b). The City of Orinda communicates emergency alerts, including evacuation information, through Genasys Protect, which it describes in its Community Awareness Frequently Asked Questions and emergency preparedness page on the City website (City of Orinda 2023c, City of Orinda 2023d). Within the City of Orinda, the proposed project is within Genasys zones ORI-E015, ORI-E019, ORI-E020, and ORI-E027 (Genasys 2023).

Although the City does not identify specific evacuation routes other than SR 24, major roadways in the City of Orinda that could be used as potential evacuation routes include the following:

- Moraga Way – A north/south road that intersects with SR 24 and Canyon Road/Moraga Road in Moraga.
- Miner Road (becomes St. Stephens Drive South of Via Las Cruces) – A long, two-lane, looping road that connects to Camino Pablo Road in the west and SR 24 in the east. This road runs through several neighborhoods.
- Orindawoods Drive – A two-lane road to the north of SR 24 that runs between Camino Pablo Road and SR 24. This road runs east/west.
- Glorietta Boulevard – A two-lane road that runs from Moraga Way to the northeast and connects to SR 24 in the City of Lafayette. This road also intersects with Rheem Boulevard.
- Rheem Boulevard – A two-lane road that connects to Moraga Way and loops to the east of Moraga Way to intersect with Moraga Road. This road primarily runs north/south and parallels Moraga Way to the east.

City of Oakland Evacuation Routes

The City of Oakland, which includes the neighborhood of Montclair, does not identify specific evacuation routes in the Hazard Mitigation Plan or General Plan (City of Oakland 2021a; City of Oakland 2022). The City of Oakland uses Genasys Protect to provide evacuation routes to the public in case of an emergency (City of Oakland 2021b). Within Oakland, the project is within Genasys zones OKL-E072, OKL-E083, OKL-E084, OKL-E085, OKL-E087, OKL-E090, OKL-E091, OKL-E099, OKL-E100, OKL-E101, OKL-E102, OKL-E108, OKL-E109, OKL-E110, OKL-E111, OKL-E113, OKL-E245, and OKL-E246 (Genasys 2023).

Although the City does not specify evacuation routes, major roadways in Oakland near the project that could be used as potential evacuation routes include the following:

- Park Boulevard – An east/west running, four-lane road that crosses the City of Oakland and connects to SR 13 in the east and I-580 in the west.
- Mountain Boulevard – A north/south running road that parallels SR 13 on the eastern side. This road is a two-lane road that has multiple on-/off-ramps to SR 13 and connects to Thornhill Drive, Duncan Way, and Broadway Terrace in the north.
- Shepherd Canyon Road – An east/west running road that parallels the power line alignment in the project's central section between Skyline Boulevard and SR 13 (via Snake Road and Mountain Boulevard).
- Thornhill Drive – A two-lane road that runs east/west and intersects with Mountain Boulevard and SR 13. This road turns into Moraga Avenue on the west side of SR 13.
- Broadway Terrace – An east/west running road to the north of the project location.
- Skyline Boulevard – A north/south running road on the eastern edge of Oakland.

City of Piedmont Evacuation Routes

The City of Piedmont does not identify specific evacuation routes in its Hazard Mitigation Plan or General Plan (City Piedmont 2023). The City of Piedmont uses Genasys Protect to provide evacuation routes to the public in case of an emergency. Within Piedmont, the project is within Genasys zone PIE-E009 (Genasys 2023).

Although the City does not specify evacuation routes, major roadways in Piedmont near the project that could be used as potential evacuation routes include the following:

- Moraga Avenue – One of the most northern roads in Piedmont. This road is a four-lane road that runs east/west, connecting Pleasant Valley Avenue in the west and SR 13 in the east.
- Pleasant Valley Avenue – A north/south running road that is primarily two lanes but has sections to the north that are four lanes. It becomes Grand Avenue at the intersection of Moraga Avenue. This

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road intersects with many other east/west running roads and eventually connects to I-580 to the south and SR 24 to the north.

- Highland Avenue – A six-lane road that runs north/south near the middle of Piedmont. It connects to Moraga Avenue in the north and ends at the intersection with Wildwood Avenue in the south.
- Wildwood Avenue – An east/west running two-lane road that turns into Lakeshore Avenue in Oakland to the west, eventually providing access to I-580. In the east, it intersects with Hampton Road and Crocker Avenue, a short north/south road that connects Wildwood Avenue to Mandana Boulevard in Oakland. This road provides additional routes for access to I-580 and other larger highways.
- Hampton Road – An east/west running two-lane road that intersects with Crocker Avenue and Estates Drive.

Alameda County Emergency Operation Plan and Evacuation Routes

Although the project footprint does not include unincorporated areas of Alameda County, nearby areas do, so information is provided on Alameda County's Emergency Operation Plan and evacuation routes. The *Alameda County Emergency Operations Plan* identifies the Sheriff's Office as the department responsible for managing and coordinating evacuations in unincorporated areas of the county (Alameda County 2023). The evacuation routes described for the cities of Oakland and Piedmont also will be useful for evacuation from areas of unincorporated Alameda County near the project. In addition to the major interstates and highways listed previously, there are numerous other roadways that connect the neighborhoods to these major evacuation routes.

5.20.1.6 PG&E Wildfire Mitigation Plan

PG&E has developed a Wildfire Mitigation Plan that is designed to reduce wildfire ignition potential, enhance wildfire situational awareness, and reduce impacts of public safety power shutoff (PSPS) events. An annual implementation report and an annual plan update are submitted to the CPUC. The 2023-2025 Wildfire Mitigation Plan (Revision 6) continues many of the actions undertaken in the 2019, 2020, 2021, and 2022 plans and introduces and updates initiatives to advance wildfire mitigation (PG&E 2024).

Sections 5.4 and 9.5 of the PG&E Wildfire Mitigation Plan detail planning and operational models and methodologies used to determine ignition probability, wildfire risk, and PSPS risk (PG&E 2024). In PG&E's WMP, "transmission lines" are defined as being 60 kV or greater. The current compilation of planning and operational models for transmission facilities include:

- Planning: 2022 Enterprise Risk Model for Wildfire Risk, a bow tie-based wildfire risk model for a distribution and transmission system.
- Planning: Wildfire Transmission Risk Model, a wildfire risk-based model for an overhead transmission system. This model is also known as the Transmission Composite Model.
- Planning: Wildfire Consequence Model, a wildland fire simulation model to estimate propagation and consequences of ignitions.
- Planning: Enhanced Vegetation Management Tree Weighted Prioritization Model, a wildfire risk-based model incorporating tree density for overhead distribution circuit segments for the purpose of enhanced vegetation management scoping and prioritization.
- Operational: Fire Potential Index Model, a model that provides estimates of the probability of large or catastrophic fire growth; used to identify real-time and near-term forecasted risk based on various weather and fuel components.
- Operational: Ignition Probability Weather Model, a model that provides estimates of the probability of an ignition given an outage on an hourly basis.

- Operational/Planning: Transmission Operability Assessment Model, a model used to assess the physical condition of transmission facilities for operational and planning decisions.
- Planning: Public Safety Power Shutoff Consequence Model, a model that projects the impacts and benefits of performing PSPS activities at the circuit or circuit segment level (formerly known as Circuit Protection Zones or CPZs).

PG&E implements its plan through standards and requirements that are communicated internally to employees and to its suppliers, contractors, and third-party employees to follow when traveling to, performing work, or operating outdoors on any forest, brush, or grass-covered land. PG&E's Wildfire Prevention Contract Requirements are based on its Standard TD-1464S (PG&E 2022) The summary of PG&E's current wildfire prevention standards and requirements may be superseded in the future following revisions to published standards and requirements.

PG&E monitors and communicates fire risk at least daily using a set of Fire Potential Index (FPI) ratings from its FPI model. The FPI ratings provide PG&E workers with a daily forecast of fire danger levels by geographical area. FPI model calculations and scale from R1 to R5-Plus consider fuel, moisture, humidity, wind speed, air temperature, and historical fire occurrence. These fire danger determination ratings are as follows:

- R1: Very little or no fire danger.
- R2: Moderate fire danger.
- R3: Fire danger is so high that care must be taken using fire-starting equipment. Local conditions may limit the use of machinery and equipment to certain hours of the day.
- R4: Fire danger is critical. Using equipment and open flames is limited to specific areas and times.
- R5: Fire danger is so critical that using some equipment and open flames is not allowed in certain areas.
- R5-Plus: The greatest level of fire danger where rapidly moving, catastrophic wildfires are possible. When fire danger is R5-Plus, there are high-risk weather triggers (for example, strong winds).

PG&E's FPI model identifies geographical areas (fire index area or FIA) over which fire danger determinations are produced daily or when conditions change the previous daily determinations. PG&E workers use the fire danger determination to plan and adjust work plans based on the current determination for the FIA. Most of the project components are in FIA 530. Approximately 1 mile of the western end of the existing overhead lines, approximately 0.80 mile of the underground lines east of the El Centro Avenue and Park Boulevard intersection, and Oakland X Substation are outside of an elevated FHSZ and are outside of an FIA. Where PG&E work is in forest-, brush-, or grass-covered lands and within 5 miles of an FIA, PG&E work will use the FPI rating for the closest FIA.

5.20.2 Regulatory Setting

The following subsections contain an overview of regulations related to wildfires and associated hazards.

5.20.2.1 Federal

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) requires utilities to adopt and maintain minimum clearance standards between vegetation and transmission voltage power lines to reduce wildfire risk. These clearances vary depending on voltage. In most cases, the minimum clearances required in state regulations are greater than the federal requirement. In California, for example, CPUC has adopted GO 95 rather than the NERC standards as the electric safety standard for the state.

North American Electric Reliability Corporation Standards

NERC is a not-for-profit international regulatory authority whose mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid (NERC 2020). NERC develops and enforces reliability standards; annually assesses seasonal and long-term reliability; monitors the bulk power system through system awareness; and educates, trains, and certifies industry personnel. NERC is the Electric Reliability Organization for North America, subject to oversight by FERC. To improve the reliability of regional electric transmission systems and in response to the massive widespread power outage that occurred on the Eastern Seaboard in 2003 as a result of a software malfunction, NERC developed a transmission vegetation management program that is applicable to all transmission lines operated at 200 kV and higher and to lower-voltage lines designated by the Regional Reliability Organization as critical to the reliability of the electric system in the region (NERC 2006). The standards take into consideration local conditions such as fire risk.

Uniform Building Code and Uniform Fire Code

The Uniform Building Code (UBC) and the Uniform Fire Code (UFC) provide codes for fire protection at the federal level. To minimize potential fire risk and damage to structures, the UBC provides requirements to which building construction, materials, and other elements or construction practices must adhere. The UFC provides design measures for installation of fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards and safety measures, hazardous material storage and use, and other general and specialized requirements pertaining to fire safety and prevention.

Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995 and updated in 2001 by the NWCG, a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions (National Interagency Fire Center 2009). An important component of the Federal Wildland Fire Management Policy is the acknowledgment of the essential role of fire in maintaining natural ecosystems. The Federal Wildland Fire Management Policy and its implementation include the following guiding principles: risk management is a foundation for all fire management activities; fire management plans and activities are based upon the best available science; and standardization of policies and procedures among federal agencies is an ongoing objective.

5.20.2.2 State

California Department of Forestry and Fire Protection

Pursuant to PRC Sections 4201 to 4204 and Government Code (GC) Sections 51175 to 51189, CAL FIRE created FHSZ maps for the state that identify areas for preventing or suppressing fires that are within SRAs or LRAs. These maps identify areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. The FHSZs then define the application of various mitigation strategies to reduce risks associated with wildland fires. The financial responsibility for preventing and suppressing fires in SRAs has been determined to be primarily on the state (PRC Section 4201) and the financial responsibility of preventing and suppressing fires in LRAs is primarily on local agencies, including cities and counties (GC Sections 51175 to 51189). SRAs were originally mapped by CAL FIRE in 1985 and LRAs were mapped in 1996. The CAL FIRE maps also show FRAs and fire hazard designations within those federal areas.

Within SRAs, the Director of CAL FIRE has designated areas as moderate, high, and very high FHSZs (PRC Section 4202). Within LRAs, the Director of CAL FIRE was charged with recommending the locations of very high FHSZs (GC Section 51178). These recommendations were to be reviewed and adopted in ordinances by local agencies (GC Section 51179), although not all local agencies have complied. All designations are mapped on the CAL FIRE website.

California Public Resources Code

The California PRC provides regulations to enhance safety with regard to the operation and management of electrical transmission lines. These include the following:

- PRC Section 8387(a): Each local publicly owned electric utility will construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment. Under subsection (b)(1) of PRC Section 8387, the local publicly owned electric utility will prepare a WMP before January 1, 2020. After January 1, 2020, a local publicly owned electric utility will prepare a WMP annually and will submit the plan to the California Wildfire Safety Advisory Board (WSAB) on or before July 1 of each calendar year. The plan will be updated annually and submitted to the WSAB by July 1 of each year. WSAB advises the California Office of Energy Infrastructure Safety (OEIS) on electrical corporations' WMPs, requirements for these plans, and other wildfire safety matters. Additionally, WSAB reviews the WMPs submitted by publicly owned electric utilities and electrical cooperatives and provides comments and advisory opinions. WSAB also serves as an additional forum for the public to provide input on the important topic of wildfire safety. At least once every three years, the submission will be a comprehensive revision of the plan.
- PRC Section 4201-4204: This section and Government Code Sections 51175 to 51189 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as FHSZs, define the application of various mitigation strategies to reduce risk associated with wildland fires.
- PRC Section 4292: This section requires the clearing of flammable vegetation around specific structures that support certain connectors or types of electrical apparatus. An approximately 10-foot radius around such structures must remain clear of vegetation for the entirety of the fire season.
- PRC Section 4293: This section requires specific clearance between conductors and vegetation. As the line voltage increases, the radius of clearance also increases. It is also required that some trees be removed if they pose the potential to fall on an electrical transmission line and cause damage.

California Public Utilities Commission

The CPUC originally adopted GO 95 in 1941. GO 95 regulates all aspects of design, construction, and O&M of electrical power lines and fire safety hazards for utilities subject to its jurisdiction. On May 4, 2000, the CPUC issued D.98-07-097 to adopt revisions to GO 166, which addressed matters relating to electric service reliability and safety and focused on minimizing potential hazards posed by damage to electric distribution facilities. On January 18, 2012, the CPUC issued D.12-01-032, which adopted significant revisions to GO 95, Overhead Electric Line Construction, and GO 165, Inspection Requirements for Electric Distribution and Transmission Facilities. Phase I and Phase II revisions to GO 95 and GO 165 addressed vegetation management practices, inspection cycles, corrective maintenance timeframes, and other fire-reduction measures in fire threat zones.

On February 5, 2014, the CPUC adopted its Decision Adopting Regulations to Reduce the Fire Hazards Associated with Overhead Electric Utility Facilities and Aerial Communications Facilities (Decision 14-02-015). In addition to updating various requirements of GO 95 and ordering further study, the decision called for creation by the CPUC of a High Fire-Threat District Map identifying zones of high hazard, elevated risk, and extreme risk for destructive utility-associated wildfires.

In January 2018, under the requirements of D.17-01-009, the CPUC adopted its High Fire-Threat District Map, which designates three areas where there is an increased risk from wildfires: Tier 3 (extreme fire risk), Tier 2 (elevated fire risk), and Zone 1 (CAL FIRE Tree Mortality HHZ Tier 1, not included in Tier 3 or Tier 2). Tier 2 fire-threat areas are where there is an elevated risk (including likelihood and potential impacts on people and property) from utility-associated wildfires. Tier 3 fire-threat areas are where there is an extreme risk (including likelihood and potential impacts on people and property) from utility-associated wildfires (CPUC 2021). These CPUC designations do not replace CAL FIRE's FHSZs.

On October 25, 2018, the CPUC entered an Order Instituting Rulemaking to Implement Electric Utility Wildfire Mitigation Plans Pursuant to Senate Bill 901 (2018), R.18-10-007, facilitating SB 901's requirement that PG&E and other utilities submit WMPs. PG&E submitted its amended 2019 Wildfire Safety Plan on February 6, 2019 (PG&E 2019), which "… describes the enhanced, accelerated, and new programs that PG&E is and will aggressively continue to implement to prevent wildfires in 2019 and beyond." On February 7, 2020, PG&E submitted its updated 2020 WMP. On February 5, 2021, PG&E submitted its updated 2021 WMP. On November 1, 2021, Change Orders for the 2021 WMP (Docket #2021-WMPs) were submitted to the CPUC. On March 27, 2023, PG&E submitted its updated 2023 Wildfire Mitigation Plan Update before submitting its 2023 Wildfire Mitigation Plan Update Revised on April 6, a second revision on August 7, 2023, a third revision on September 27, 2023, and a fourth revision on January 8, 2024 (PG&E 2024). The State of California OEIS issued a decision on the WMP in December 2023 that included required areas for continued improvement (OEIS 2023). PG&E prepared a sixth version of the WMP and submitted it to the state on July 5, 2024 (PG&E 2024).

The CPUC also provides an annual guide to utilities for creating their WMPs based on guidance provided in D.19-05-036. The WMP template includes substantive and procedural requirements for WMPs based on lessons learned and input from stakeholders and the WSAB. The most recent WMP 2021 guidelines were focused on such principles as standardizing information collection, systematizing qualitative information, and tracking utility progress toward wildfire risk reduction (CPUC 2020).

California Senate Bill 901

Passed in 2018, Senate Bill 901 adopted new provisions of California Public Utilities Code Section 8386 requiring all electric utilities to prepare, submit, and implement annual WMPs. These plans describe the utilities' strategies to construct, operate, and maintain their electrical lines and equipment in a manner that will help minimize the risk of catastrophic wildfires associated with those electrical lines and equipment.

California Senate Bill 1028

Senate Bill 1028 (2016) requires each electrical corporation to construct, maintain, and operate its electrical lines and equipment in a manner that would minimize the risk of catastrophic wildfire posed by those electrical lines and equipment and makes a violation of these provisions by an electrical corporation a crime under state law. The bill also requires each electrical corporation to annually prepare a WMP and submit to CPUC for review. The plan must include a statement of objectives, a description of preventive strategies and programs that are focused on minimizing risk associated with electric facilities, and a description of the metrics that the electric corporation uses to evaluate the overall WMP performance and assumptions that underlie the use of the metrics.

5.20.2.3 Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local (city and county) discretionary regulations except for air districts and Certified Unified Program Agencies with respect to air quality and hazardous waste regulations. However, local plans and policies are considered for informational purposes and to assist with the CEQA review process.

Refer to Section 5.9, Hazards, Hazardous Materials, and Public Safety, of this PEA for an overview of local emergency response plans.

Contra Costa County General Plan 2035, Public Facilities/Services and Safety Element

Contra Costa County contains significant vegetation and wildlife habitats that pose a considerable fire hazard throughout the County. The *Contra Costa County General Plan* includes a Public Facilities/Services Element and a Safety Element with goals and policies to minimize the risk of fire hazards and establish policies for immediate emergency response (Contra Costa County 2018). The Public Facilities/Services Element establishes the following goals (Contra Costa County 2005a):

- 7-Y. To ensure a high standard of fire protection, emergency, and medical response services for all citizens and properties throughout Contra Costa County.
- 7-Z. To reduce the severity of structural fires and minimize overall fire loss.
- 7-AB. To minimize the cost of fire protection services through utilization of modern fire protection practices and technologies.
- 7-AD. To provide special fire protection for high-risk land uses and structures.

The Contra Costa County Public Facilities and Services Element includes a 2004 map of the Fire Protection Districts and Facilities (Contra Costa County 2005a).

The Contra Costa County Safety Element includes the following relevant public protection services and disaster planning implementation measures (Contra Costa County 2005b):

- 10-ap. The County has adopted a local hazard mitigation plan pursuant to the requirements of the Federal Disaster Mitigation Act of 2000 and will implement and evaluate the Plan on a regular basis as necessary to comply with federal and state laws. The Sheriff's Office of Emergency Services will be the lead County department responsible for preparing the hazard mitigation plan.

City of Orinda General Plan Safety Element

The City of Orinda considers wildfire a hazard of very high concern (City of Orinda 2023e). The *City of Orinda General Plan* includes a Safety Element with policies to minimize the risk of wildland and urban fire hazards. It establishes the relevant following goals and policies associated with wildfires (City of Orinda 2023e):

- Goal S-4: A community that seeks to avoid and minimize the risk of loss of life, injury, and property loss from wildfires and urban fires.
- Policy S-41 Continue to coordinate with PG&E to underground power lines throughout the community, especially in the wildland-urban interface and fire hazard severity zone areas where wildfire risk is greatest.

City of Oakland General Plan Safety Element

The City of Oakland identifies wildfire as its primary fire hazard risk (City of Oakland 2022). Wildfire risk is at its highest from May to October. The *City of Oakland General Plan* includes a Safety Element with policies to minimize the risk of wildland and urban fire hazards. It establishes the following relevant policy:

- Policy FI-3 Prioritize the reduction of the wildfire hazard, with an emphasis on prevention.

City of Piedmont General Plan Environmental Hazards Element

The City of Piedmont combines two mandatory elements, Safety and Noise, into one Environmental Hazards Element (City of Piedmont 2020). The eastern portion of the City of Piedmont is characterized by substantial areas of wildland fire risk. The City's Environmental Hazards Element includes policies to minimize the risk of wildland and urban fire hazards, including the following:

- Goal 19: Wildfire and Flooding Hazards. Reduce exposure to wildfire, flooding, and other climate-related hazards.
- Policy 19.2: Fuel Management Implement. Create vegetation management programs which reduce the fuel load and potential for wildfire. This should include the removal of invasive fire-prone vegetation and the use of less flammable plants for landscaping, especially on hillside sites. Public education on "defensible space" and good vegetation management practices should be strongly promoted.

- Policy 19.3: Fire-Fighting Water Flow. Ensure that Piedmont's water system remains adequate for fire-fighting purposes. As funding allows, undertake improvements for areas where capacity is determined to be deficient.

5.20.3 Impact Questions

5.20.3.1 Impact Questions

The project's potential effects on wildfire resources were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The criteria and conclusions are summarized in Table 5.20-2 and discussed in more detail in Section 5.20.4.

Table 5.20-4. CEQA Checklist for Wildfire

If Located In or Near State Responsibility Areas or Lands Classified as Very High Fire Hazard Severity Zones, Would the Project	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

5.20.3.2 Additional CEQA Impact Questions

None.

5.20.4 Potential Impact Analysis

Project impacts related to wildfire were evaluated against the CEQA significance criteria and are discussed in the following sections. The impact analysis evaluates potential project impacts during the construction phase and the O&M phase.

5.20.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts related to wildfires was evaluated for each of the criteria listed in Table 5.20-2, as discussed in Section 5.20.4.4.

5.20.4.2 Applicant-Proposed Measures

Emergency access is addressed in APM TRA-1, which includes developing traffic control plans to detail road and lane closure or width reduction or traffic diversions as required by encroachment permits; traffic controls in the form of signs, cones, and flaggers to minimize effects on emergency vehicle access and evacuation routes; notification to residents and emergency service providers of upcoming road closures; and implementing residential safe transport throughout a temporary road closure restricting residential access. In addition, PG&E will implement the following APMs:

APM WFR-1: Construction Fire Prevention Plan. A project-specific Construction Fire Prevention Plan for construction of the project will be prepared prior to initiation of construction by PG&E. The PG&E plan will be approved by the CPUC. The final plan will be approved by the CPUC at least 30 days prior to the initiation of construction activities. The plan will be fully implemented throughout the construction period, and it will include the following at a minimum:

- The purpose and applicability of the plan
- Incorporation of the requirements in PG&E's current *Utility Standard TD-1464S for Preventing and Mitigating Fires While Performing PG&E Work*
- Responsibilities and duties for compliance
- Preparedness training and drills
- Procedures for fire reporting, response, and prevention that include:
  - Identification of daily site-specific risk conditions
  - The tools and equipment needed on vehicles and on hand at sites
  - Reiteration of fire prevention and safety considerations during tailboard meetings
  - Daily monitoring of the Red-Flag Warning System with appropriate restrictions on types and levels of permissible activity
- Coordination procedures with federal, state, and local fire officials and emergency responders, including notifications of temporary lane or road closures
- Crew training, including the construction fire prevention practices described in APM WFR-2
- Method(s) for verifying that all plan protocols and requirements are being followed

PG&E or its contractor will be responsible for training project personnel and enforcing all provisions of the PG&E Construction Fire Prevention Plan, as well as performing other duties related to fire detection, prevention, and suppression for the project. Construction activities will be monitored to ensure implementation and effectiveness of the plan.

APM WFR-2: Fire Prevention Practices. PG&E will implement the following fire prevention practices at active construction sites and during maintenance activities:

- Existing PG&E personnel conducting maintenance on the project are trained on the *PG&E Utility Standard TD-1464S for Preventing and Mitigating Fires While Performing PG&E Work* or relevant current standard and will follow the standard in regard to training, preparation, communication methods and means, observations of and alerts concerning weather conditions including NWS events, and PG&E's work restrictions and fire mitigation required for elevated PG&E Utility FPI ratings (R4, R5, or R5-Plus).
- Construction personnel will be trained in fire-safe actions, including PG&E's current Utility Standard for Preventing and Mitigating Fires While Performing PG&E Work, Wildfire Prevention Contract Requirements, and the project's PG&E Construction Fire Prevention Plan concerning initial attack, firefighting, and fire reporting. Construction personnel will be trained and equipped to extinguish small fires to prevent them from growing into more serious threats.

- Construction personnel will have fire suppression equipment on all construction vehicles per PG&E Utility Standard TD-1464S and will be required to park vehicles away from dry vegetation. Water tanks and/or water trucks will be sited or available at active project sites for fire protection during construction.
- All construction crews and inspectors will be provided with radio and cellular telephone access that is operational in all work areas and access routes to allow for immediate reporting of fires. All fires will be reported to the fire agencies with jurisdiction in the area upon discovery of the ignition.
- While performing stationary ground-level jobs or activities from which a spark, fire, or flame may originate (for example, welding, cutting, grinding), all flammable material (for example, grass, leaf litter, dead or dying tree) must be removed down to the mineral soil around the operation for a minimum of 10 feet.
- PG&E General Requirements for Wildfire Mitigation (R1 to R3) apply for PG&E work areas located farther than 5 miles from an FIA when the nearest FIA has an elevated FPI rating (R4, R5, or R5-Plus), except during NWS Red-Flag Warnings and Fire Weather Watch events when R5 mitigations would apply.
- For work within an FIA, during Red-Flag Warning and Fire Weather Watch events, as issued by the NWS, and elevated PG&E Utility FPI rating (R4, R5, or R5-Plus), all construction activities will refer to the current PG&E Standard TD-1464S and related requirements such as PG&E Wildfire Prevention Contract Requirements, Attachment 1 – Wildfire Mitigation Matrix, and Attachment 2 – Wildfire Risk Checklist Fire Mitigations. With the increased potential fire risk of R4, additional water resources are required, and a working fire watch is assigned to be able to continue work as long as the weather conditions are evaluated to ensure it remains safe to continue work.
- For R5 and R5-Plus ratings, measures beyond R1 to R4 levels include posting a dedicated fire watch at the jobsite, making available a trailer-mounted water tank or alternative water delivery method at the jobsite, and modifying the fuel sources surrounding the jobsite. All planned work is suspended during an R5-Plus fire rating. During all emergency work being performed for an R5-Plus fire rating, personnel must have a PG&E Safety and Infrastructure Protection Team on standby or a 300-gallon water tender available. Use of heavy equipment (blades, dozers, skid steers, excavators, back hoes), construction hot work, and electrical equipment work (including tasks related to conductors, pole, and overhead equipment from which a spark, fire, or flames may originate) are allowed with the R5 mitigations in place but not allowed during R5-Plus conditions.

5.20.4.3 Potential Impacts

As described in Chapter 3, Project Description, the project will include rebuilding the four PG&E existing 115 kV circuit lines and structures and minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead, and approximately 1 mile will be rebuilt in city streets. Project O&M will be conducted with existing staffing using existing access.

a) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan? *Less-than-Significant Impact*.

As discussed in Section 5.20.1.1, portions of the project are in areas identified as very high FHSZs, including some in SRAs. However, emergency access will be maintained throughout construction. Construction vehicles and equipment are anticipated to access project construction areas by using existing PG&E access and paved public roads or existing dirt access roads. Construction vehicles and equipment needed at the pull sites will follow designated access routes and are expected to be parked or staged within the project ROW or alongside existing access roads. As discussed in Section 5.20.1.5, work areas on local roads with crane activities may require temporary road closures of up to approximately 10 working days (2 calendar weeks); however, temporary road closure locations will have ingress and egress available on both sides of the closures. Work areas at the end of a roadway with no secondary vehicle access will maintain residential foot access, although potentially not residential vehicular access. These residents will be offered the option of safe transport throughout the temporary road closure per APM TRA-1.

Per APM WFR-1: Construction Fire Prevention Plan, closures will be coordinated with Caltrans or local jurisdictions to reduce the effects to potential temporary and short-term emergency access. At locations where full road closures may be needed for construction staging and access, emergency responders will be provided options for ingress and egress and will maintain emergency access. Emergency responders and area residents will be notified prior to construction in locations where roads are expected to be closed temporarily as part of APM TRA-1, ensuring access for emergency vehicles. APM TRA-1 also includes developing traffic control plans to detail road and lane closure or width reduction or traffic diversions as required by encroachment permits, and traffic controls in the form of signs, cones, and flaggers to minimize effects on emergency vehicle access and evacuation routes. Five of the potential road closures will occur at the end of deadend roads where egress from residences will be temporarily impacted for up to approximately 10 working days (2 calendar weeks) at time. PG&E will implement advance notification of construction work per APM AIR-1, APM NOI-1, and APM TRA-1. Project construction will not result in a substantial negative effect on emergency access.

With the completion of the project, roadway operations will return to preconstruction conditions as described in APM TRA-2. PG&E's typical operation and maintenance activities will continue with the rebuilt project. The only lane closures that may occur during operations is closure of a lane on Park Boulevard for maintenance work on the underground section of the project, and most of the underground section is outside designated FHSZs. Project operation and maintenance will not result in a significant effect on emergency access.

Therefore, the project will not substantially impair an adopted emergency response plan or emergency evacuation plan, and the impact will be less than significant.

b) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? *Less-than-Significant Impact*.

As discussed in Section 5.20.1.3, the local topography has the capability to funnel winds, increase wind speeds, erratically alter wind direction, facilitate fire spread, and promote extreme fire behavior. In addition, portions of the project are located in SRAs and land classified as very high FHSZs. During construction, the primary risk for potential fire hazards will be associated with the use of vehicles and equipment; for example, driving on vegetated areas or using a chain saw, either of which could generate heat or sparks that could ignite dry vegetation and cause a fire. During construction, PG&E will implement APM WFR-1: Construction Fire Prevention Plan and APM WFR-2: Fire Prevention Practices that contain elements such as requiring workers to be trained in fire prevention practices and having fire suppression equipment on all construction vehicles to reduce the wildland fire risk in the project area. In addition, PG&E will implement APM TRA-1, which includes developing traffic control plans to detail road and lane closure or width reduction or traffic diversions as required by encroachment permits; traffic controls in the form of signs, cones, and flaggers to minimize effects on emergency vehicle access and evacuation routes; and notification to residents and emergency service providers of upcoming road closures. Implementation of these APMs will minimize the potential for construction activities to start a fire and will provide the tools, training, and preparation to address a fire in the unlikely event one does start. The western segment is underground and in a highly urbanized area and wildfire risks during construction are not expected. Impacts of project construction to people and structures from wildland fires is less than significant.

Completion of the project will replace aging structures with stronger, more fire resistant structures and conductors. The structures that were replaced in 2020 and 2021 will be retained (6 of the 75 structures along the two power lines), resulting in no change in wildfire risk post-construction at those locations. For structures that will be removed (21 of the 75) and rebuilt in an underground configuration, the wildfire risk reduction is 100 percent because the source of risk is eliminated. The remaining structures (48 of the 75) will be replaced by new structures placed near the existing structures. For each of these 48 structures, the WTRM described in Section 5.20.1.4 was used to calculate the updated post-construction wildfire risk value (refer to Table 5.20-2).

The WTRM estimates an approximately 90 percent reduction in wildfire risk from the entire project, reducing potential exposure of the community to pollutant concentrations from wildfire. Impacts will be less than significant.

c) **If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? *Less-than-Significant Impact*.**

As discussed in Section 5.20.1.1, portions of the project are in areas identified as very high FHSZs, including some in SRAs. Construction activities, including work areas, staging areas, and laydown areas, and temporary access associated with rebuilding the power lines could cause a temporary increase in fire risks from overland travel, the use of equipment that may create sparks, and construction equipment and vehicles that contain combustible materials such as fuels and oils and ignition sources. However, PG&E will comply with all applicable California Health and Safety Codes and ordinances regulating the handling, storage, and transportation of hazardous materials, which will help to minimize the potential for accidental conditions, including fire. Additionally, during construction, PG&E will implement APM WFR-1: Construction Fire Prevention Plan and APM WFR-2: Fire Prevention Practices that include requirements such as worker training in fire prevention practices; having fire suppression equipment on all construction vehicles; parking vehicles away from dry vegetation; and removing flammable material for a minimum 10 feet while performing stationary ground-level activities from which a spark, fire, or flame may originate.

In addition, construction vehicles and equipment are anticipated to access project construction areas by using existing paved roads, existing PG&E access, existing dirt access roads, or overland access. Minor improvements will be made to the existing access roads in unincorporated Contra Costa County. Otherwise, no modifications to existing roads and no new temporary construction access roads are required. No fuel breaks are required for project construction. Two 4,000-gallon water trucks will be used during construction activities in unincorporated Contra Costa County, where fire hydrants and related fire suppression infrastructure are not present.

The proposed project is a maintenance project needed to replace existing 115 kV power line equipment that has reached the end of its useful life. As discussed previously under Impact b, completion of the project will reduce existing fire risk. Maintenance of electrical infrastructure for the rebuilt power lines will be the same as for the existing lines and will include activities to repair and replace infrastructure components to manage operational risk associated with wildfire and to avoid service interruptions and outages. Maintenance activities will be implemented per the current PG&E WMP, as updated yearly, reviewed by WSAB and approved by the State of California OEIS. The project will not require new fuel breaks, emergency water sources, or other utilities. Therefore, impacts will be less than significant.

d) **If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? *Less-than-Significant Impact*.**

As discussed in Section 5.20.1.1, portions of the project are in areas identified as very high FHSZs, including some in SRAs. Project construction will result in a negligible increase in impervious area. During construction of the project, some grading improvements will be made to existing unpaved roads for construction vehicle access within the project area. Very limited grading may be needed in some project work areas and staging areas for equipment access. The grading will not alter drainage patterns in the area. Appropriate SWPPP measures for erosion control will be implemented at project work areas, staging areas, and access as described in APM AIR-1 and APM HYD-1. As described in APM HYD-3, site restoration at the end of construction will replace vegetation, which will help minimize any post-construction erosion. The western portion of the project, where the power lines will be rebuilt underground, is in a generally level location, is not in a very high FHSZ, will replace curb and gutter, and will not expose people or structures to risks of downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes. Project construction will not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes, and construction impacts will be less than significant.

O&M activities will include utility maintenance, vegetation clearing, tree pruning, and other related O&M activities. O&M activities conducted during operation of the rebuilt project will be consistent with existing O&M activities for the project and in compliance with existing state and federal laws, rules, and regulations. The project will have no impact on people and structures, including downslope or downstream flooding or landslides, resulting from runoff, post-fire slope instability, or drainage changes, and no operational impacts will occur.

5.21 Mandatory Findings of Significance

Section 15065 of the CEQA Guidelines requires that a lead agency find that a project may have a significant effect on the environment where there is substantial evidence, in light of the whole record, that any of several conditions may occur. These conditions are included in Appendix G of the CEQA Guidelines and are listed in Table 5.21-1, which also lists the impact conclusion for each criterion. Additional discussion is provided following the table.

Table 5.21-1. CEQA Checklist for Mandatory Findings of Significance

Criterion	Impact Assessment
Does the project have the potential to substantially 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?	Less-than-Significant Impact
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.)	Less-than-Significant Impact
Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Less-than-Significant Impact

5.21.1 Impact Assessment: Potential to Substantially Degrade the Quality of the Environment

5.21.1.1 Biological Resources

As discussed in Section 5.4, the proposed project will not result in any significant impacts to biological resources.

Twelve special-status plant species were determined to have moderate to high potential to occur in the BSA based on the presence of potentially suitable habitat and known occurrences in the vicinity. Only three special-status plant species (pallid manzanita, Oakland star-tulip, and Jepson's button thistle) were observed within the botanical resources field survey area. However, no special-status plant species were identified within the project impact area. Although there is potential for occurrence in later years of annual species not previously observed, the plant AMMs from the PG&E BAHCP will be implemented and, therefore, impacts will be less than significant. Similarly, with implementation of BAHCP AMMs, potential impacts to pallid manzanita within the BAHCP Map Book zones will be reduced and will be less than significant. In addition, biological monitors will be present to facilitate avoidance of special-status plants (Applicant-proposed measure [APM] BIO-1).

Suitable habitat for 12 special-status wildlife species was identified in the wildlife assessment field survey area. These 12 species were either observed during the wildlife assessment or determined to have a moderate or high potential to occur. These species are Crotch's bumble bee, monarch butterfly, foothill yellow-legged frog, California red-legged frog, Northwestern pond turtle, Alameda whipsnake, pallid bat, Townsend's big-eared bat, Western red bat, San Francisco dusky-footed woodrat, Cooper's hawk, and golden eagle. Monarch buttery has moderate potential for foraging habitat. Foothill yellow-legged frog has moderate potential for habitat near Moraga Creek, which includes the portions of the project footprint in and near the Wilder landing zone and staging area and Moraga Substation. Northwestern pond turtle has a low to moderate potential in the San Leandro Creek Watershed east of Manzanita Drive/Skyline Boulevard; tributary streams may provide suitable habitat if pools are present. PG&E will implement the applicable measures incorporated in the BAHCP, its Bay Area O&M ITP, and the ITP FEIR, such as the Alameda whipsnake pre-activity habitat features survey and exclusion barriers. The ITP establishes a comprehensive approach to avoid, minimize, and fully mitigate impacts on covered species and habitat. The ITP provides incidental take coverage for three species, including Alameda whipsnake. The ITP FEIR includes measures, such as protecting nesting birds, designed to minimize impacts to state-listed and other special-status species. Project-specific APMs also will be implemented to protect wildlife. Impacts to wildlife species will be less than significant.

Riparian habitat and other sensitive communities are present in and near the project footprint. There is potential for both direct and indirect impacts to riparian habitats, primarily along access roads and near Moraga Substation, and to other sensitive communities from work activities being conducted in and near these habitats. Very little riparian habitat exists in the project study area, and only minor trimming of riparian habitat will be necessary to provide construction equipment access. With the implementation of measures from the BAHCP, ITP, and ITP FEIR such as worker environmental awareness training, identifying and avoiding sensitive resources, limiting vegetation removal to the greatest extent feasible, minimizing spills and erosion, managing weeds, and restoring temporary disturbance areas, both direct and indirect effects will be minimized.

Aquatic resources were identified adjacent to or within proposed work areas. The aquatic resource delineation identified 5 wetlands and 15 non-wetland water features in the aquatic resources delineation field survey area. The project has been designed to avoid impacts on waterways and wetlands to the greatest extent feasible, and the project will not remove, fill, or result in the hydrologic interruption to waterways or wetlands. No direct impacts to aquatic resources are expected to occur and permits under Sections 401 and 404 of the Clean Water Act will not be required. Impacts to wetlands and other aquatic resources will be minimized with implementation of the general measures from the BAHCP, ITP, and ITP FEIR.

The project will be consistent with County and City regulations regarding trees, watercourses, and riparian vegetation. Trimming or removal of protected or heritage trees may be necessary for construction access and will be conducted by a certified arborist in accordance with accepted arboricultural procedures to avoid impacting tree health or to make the decision to remove the tree if trimming is not feasible. Trimming of oaks may be necessary and will be conducted by a certified arborist to avoid impacting tree health or to make the decision to remove the tree if trimming is not feasible. Watercourses and riparian vegetation will be avoided to the greatest extent feasible. In addition, measures from the BAHCP, ITP, and ITP FEIR will be implemented as part of the project.

During construction of the project, there is the potential for vehicle and equipment collisions with wildlife; however, PG&E will restrict vehicle and equipment use to designated work areas and approved access roads and will enforce speed limits for vehicles and equipment on the ROW and on access roads in accordance with the general measures from the BAHCP, ITP, and ITP FEIR. There also is potential for avian interactions with PG&E power lines and structures, including collisions and electrocutions. PG&E will minimize the potential for electrocution or accidental line collision by rebuilding the electrical lines in accordance with avian-safe construction standards and will implement the processes and procedures outlined in the PG&E Avian Protection Plan. Conductors and ground wires will be spaced sufficiently apart so that raptors will not be electrocuted and all transmission, power, and substation facilities for the proposed project will be designed to be avian safe.

Project O&M will be conducted with existing staffing using existing access, so no O&M impacts to biological resources will occur.

Therefore, the project does not have the potential to substantially 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, or substantially reduce the number or restrict the range of a rare or endangered plant or animal.

5.21.1.2 Cultural Resources

As discussed in Section 5.5, the proposed project will not result in any significant impacts to cultural or tribal resources. Four resources were evaluated as eligible for listing in the CRHR. None of the eligible architectural resources will be significantly impacted by the proposed project. The eligible resources will continue to be used in kind and not impacted physically or visually; they will continue to convey their significance under their applicable CRHR criteria.

Intensive pedestrian survey and records searches did not identify any archaeological sites within the archaeological API. Only one resource has been recorded within 0.25 mile of the API. The potential to encounter surface archaeological resources or buried archaeological resources is low. Although no archaeological resources are known or anticipated in the API, APMs will be implemented to further reduce the potential for impact to archaeological resources.

Project O&M will not disturb ground and will occur within city streets, facilities, or electrical line ROWs and, as such, will not cause a substantial adverse change in the significance of an archaeological or historical resource. Impacts to cultural resources will be less than significant.

Existing conditions and past onsite uses do not indicate that human remains are present within the API. However, the inadvertent discovery of human remains during project work is possible. APM CUL-3, which requires protocols for the inadvertent discovery of human remains, will be implemented to further minimize potential impacts on cultural resources. Therefore, the project will not disturb human remains, including those interred outside of dedicated cemeteries; the potential impacts will be less than significant.

The project will not eliminate important examples of the major periods of California history or prehistory.

5.21.2 Impact Assessment: Potential for Impacts that are Cumulatively Considerable

Chapter 7 identifies potential cumulative projects in the vicinity of the proposed project. Chapter 7 also provides an analysis of potential cumulative impacts for aesthetics; agriculture and forestry resources; air quality; biological resources; cultural resources; energy; geology, soils, and paleontological resources; greenhouse gases; hazards, hazardous materials, and public safety; hydrology and water quality; noise; recreation; transportation; tribal cultural resources; utilities and service systems; and wildfire. For land use, minerals, population and housing, and public services, either the project has no impacts or the impacts are so minor they will not contribute to cumulative impacts in the area.

As discussed in Chapter 7, the proposed project does not have impacts that are individually limited but cumulatively considerable.

5.21.3 Impact Assessment: Potential for Substantial Adverse Effects on Human Beings

5.21.3.1 Air Quality

As discussed in Section 5.3, the proposed project will not result in any significant impacts to air quality.

Construction activities will cause temporary air pollutant emissions. With incorporation of APMs, project construction emissions will be lower than Bay Area Air Quality Management District CEQA thresholds for all pollutants analyzed, including diesel particulate matter (PM) emissions (conservatively represented by PM_{10} emissions). The project will not expose sensitive receptors to substantial criteria pollutant concentrations or toxic air contaminants. Construction of the project will not result in a cumulatively considerable net increase of any pollutants for which the region is in nonattainment (PM_{10}, $PM_{2.5}$, and the ozone precursors [nitrogen oxides and reactive organic gas]) because the emissions will be temporary and below significance thresholds with implementation of APMs.

Because the project involves the rebuilding of existing infrastructure, no change to current operation and maintenance activities is expected. For this reason, the change in operational air emissions from the project was not estimated but was instead presumed to be zero. With no change in operational air emissions, the O&M of the project will not conflict with or obstruct implementation of the applicable air quality plan and thus will have no impact.

5.21.3.2 Hazards

As discussed in Section 5.9, the proposed project will not create a significant hazard to the public or environment and will not result in any significant impacts associated with hazards, hazardous materials, or public safety.

There are 17 schools within 0.25 mile of the project, with 1 school in Orinda, 15 schools in Oakland, and 1 school in Piedmont. No acutely hazardous materials or waste will be used or will be generated by the project. Construction impacts will be associated with the use of equipment with hydraulic fluids and fuels that could create a hazard in the event of a spill. However, implementation of APMs will reduce that potential impact to less than significant.

The proposed project will not be located on sites listed pursuant to Government Code Section 65962.5. No impact will occur because project construction will not occur on listed properties. Implementation of APMs will further ensure that human health and the environment are protected.

No project components will be located within any airport land use plan or within 2 miles of a public airport or public use airport. No safety hazards that will affect people residing or working in the project area will result from the project.

The proposed project will not conflict with an adopted emergency response plan or evacuation plan. Temporary road and lane closures (including rolling stops) are anticipated when certain sections of the PG&E lines are being removed or reconductored at the roadway overhead crossings. In some locations, short-term road closures may be needed, primarily for the crane work activities on surface streets where power line structures are being replaced overhead. For the underground power line construction, temporary short-term closures of one travel lane and one parking lane along Estates Drive, Park Boulevard, and Park Boulevard Way are expected for the placement of the vaults, trenching, and duct bank installation, with one lane remaining open to allow through traffic in each direction. Where temporary partial or complete road closures occur, PG&E will implement temporary traffic control APMs to minimize effects on traffic and transportation, including emergency vehicle access and evacuation routes. Construction impacts to emergency access and evacuation will be less than significant.

Construction of project facilities will require the use of motorized heavy equipment, including trucks, cranes, backhoes, and air compressors. Although this equipment requires the use of hazardous materials, such as gasoline, diesel, oil, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, and other fluids, these materials will be transported to the work sites according to U.S. Department of Transportation standards and used in designated construction staging areas or other suitable locations identified prior to the onset of construction. PG&E will implement APMs that require construction crews to be trained in safe handling of hazardous materials prior to the initiation of construction, which will further reduce the small risk of minor exposures by the environment, the public, or site workers to potentially hazardous materials during construction. The project is not expected to use or store large quantities of hazardous materials during construction. Hazardous materials will be transported, used, and disposed of in accordance with appropriate procedures. When not in use, hazardous materials will be properly stored to prevent drainage or accidents.

There is potential for unknown contaminated soils to be encountered during construction. If contaminated soils are encountered in during construction, APMs will be implemented that require potentially contaminated soil that has not been precharacterized to be stockpiled separately to be tested, managed, and transported for disposal as appropriate. If suspected hazardous substances or waste are unexpectedly encountered during trenching activities, work will be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. The project will not create a significant hazard to the public or environment.

Much of the project is in areas designated as fire hazard severity zones by the California Department of Forestry and Fire Protection and in CPUC-designated HFTDs. The primary risk for potential fire hazards will be associated with the use of vehicles and equipment during construction, which could generate heat or sparks that could ignite dry vegetation and cause a fire. During construction, PG&E will implement APMs that require workers to be trained in fire prevention practices and to carry emergency fire suppression equipment to reduce the wildland fire risk in the project area. PG&E will continue to comply with its current Wildfire Mitigation Plan, as updated yearly. As discussed in Section 5.20, Wildfire, after construction, the project will result in an estimated 90-percent reduction in wildfire risk.

The project construction and O&M activities will not create a significant hazard to air traffic from the installation of PG&E project components. PG&E has coordinated with the FAA, submitting a Notice of Proposed Construction or Alteration pursuant to 14 Code of Federal Regulations Section 77 for each expected rebuilt 115 kV structure. The FAA has not found a need for any marking or lighting on the proposed structures. Further, PG&E will coordinate with nearby airports regarding helicopter flight plans during construction activities.

Light-duty and medium-duty helicopters are expected to be used only in the eastern section of the project as part of the conductor stringing operation and to support construction survey staking, lifting or transporting structure components, crew transport to towers, and lifting of equipment for installation of towers. Helicopters carrying structure components will not be flown over residences or west of Manzanita Drive. In the unlikely event that final construction plans require otherwise, all FAA requirements will be met, and PG&E will coordinate with potentially affected residents, providing a minimum of 30 days of advance notice. Trails and roads used by the public will be managed with traffic control measures and flaggers to temporarily pause access and vacate the trail or road while helicopters fly loads over the trail or road. Impacts to the public or environment from the transport of heavy materials using helicopters during construction are less than significant.

No changes in O&M activities are anticipated with implementation of the project. The routine annual inspections, detailed inspections, and aerial inspections and as-needed maintenance of power lines will not change from existing conditions. Therefore, no impacts associated with O&M will occur.

Other potential hazards associated with the project electrical facilities include the presence of high voltage, open-air conductors, transmission lines, power lines, and distribution lines. Proposed upgrades to the existing facilities will update and conform with the Institute of Electrical and Electronics Engineers' safety standards. Additionally, all workers will be trained in appropriate safety procedures.

The project will not result in environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

6. Comparison of Alternatives

Section 15126.6 of the CEQA Guidelines requires that a range of reasonable alternatives for a project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, be described in an EIR. The EIR also must evaluate the comparative merits of the alternatives. The CEQA Guidelines also require an evaluation of the No Project Alternative. Because the CPUC may do an EIR for the state environmental document, this PEA section has been prepared consistent with CEQA requirements to support the CPUC action.

Section 6.1 provides a brief summary of the four alternatives to the proposed project and the No Project Alternative. The section also describes the approach for comparing the potential impacts of the alternatives to the proposed project. Section 6.2 includes the environmental setting and potential impacts of the four alternatives to the proposed project. Section 6.3 provides a summary of the alternative comparison results and ranks the alternatives in order of environmental superiority.

6.1 Alternatives Comparison

This chapter compares the potential impacts of alternatives, including the No Project Alternative, against the proposed project. The comparison of potential impacts is organized with a proposed project discussion followed by the discussions for each of the possible project alternatives. The chapter concludes with ranking the proposed project and the alternatives and summarizing the potential impacts for each.

6.1.1 Alternatives Compared

Chapter 4 of this PEA describes four possible alternatives carried forward for evaluation against the proposed project: the Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground Alternative (Alternative A); the Manzanita Drive-Colton Boulevard-Estates Drive Underground Alternative (Alternative B); the Shepherd Canyon Road Underground Alternative (Alternative C); and the Proposed Project with Campground Overhead Option Alternative (Alternative E). These alternatives would meet the underlying project purpose and objectives and are potentially feasible. The following paragraphs briefly summarize these alternatives as well as the No Project Alternative. Refer to Chapter 4 for additional detail on Alternatives A, B, C, and E.

Alternative A: Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground Alternative. This alternative would replace three of the four existing Moraga–Oakland X circuits within the same ROW from Moraga Substation to the intersection with Monterey Boulevard. From there, one circuit would be installed underground southeast in Monterey Boulevard and Lincoln Avenue to Oakland X Substation for a total of approximately 3.1 miles. The other two circuits would continue overhead in the ROW on one set of double-circuit structures to the intersection of Estates Drive and Park Boulevard and transition to underground to Oakland X Substation in the same streets as the proposed project. In addition, Alternative A would include reconductoring two portions of the Moraga–Claremont Circuits 1 and 2 115 kV lines (approximately 3 miles total), which would include replacing conductors and would likely include replacement of structures, primarily in parks and open space but also through and adjacent to residential neighborhoods in Orinda and Oakland. Alternative A had been one of PG&E's Northern Oakland Area Reinforcement projects, and it represents a different engineering alternative to the proposed project with a different type of overhead conductor and underground cable configuration.

Alternative B: Manzanita Drive-Colton Boulevard-Estates Drive Underground Alternative. All four of the existing Moraga–Oakland X 115 kV lines would be replaced overhead in the existing ROW in the eastern section, in Contra Costa County, the same as the proposed project. In the central and western sections of the project, the lines would be replaced underground in Oakland and Piedmont and the existing overhead lines would be removed. An overhead span between new riser poles and a transition station (approximately 0.5 acre) would be used to cross over SR 13 and the Hayward Fault. New riser poles also would be required near Manzanita Drive where the lines transition from aboveground to underground. The western-most mile of underground line between the intersection of Estates Drive and Park Boulevard and Oakland X Substation would be the same as the proposed project. This alternative would have approximately 1.6 miles of lines replaced overhead and approximately 4.2 miles of lines replaced underground.

Alternative C: Shepherd Canyon Road Underground Alternative. All four of the existing Moraga–Oakland X 115 kV lines would be replaced overhead in the existing ROW in the eastern section and part of the central section, matching the proposed project. From there, the route would transition underground at approximately the intersection of Saroni Drive and Gunn Drive, and the two double duct banks would go south in Saroni Drive for approximately 0.1 miles to Shepherd Canyon Road and progress westbound for approximately 1.0 mile. The lines would transition to aboveground in a transition station near the City of Oakland Municipal Service Yard. From there, the four circuits would connect to two new structures north of Shephard Creek before connecting to the existing ROW to cross SR 13 and the Hayward Fault. The four circuits would continue overhead in the existing ROW to the intersection of Estates Drive and Park Boulevard, where they would transition underground in Park Boulevard and Park Boulevard Way to Oakland X Substation in the western section, also matching the proposed project. This alternative would have approximately 3 miles of lines replaced overhead and approximately 2 miles of lines replaced underground.

Alternative E: Proposed Project with Campground Overhead Option Alternative. This alternative would be the same as the proposed project other than the two structures northwest of the Eastport Staging Area entrance of the EBRPD Sibley Volcanic Regional Preserve. The two structures would be replaced approximately 325 feet northwest of the existing locations. This alternative was developed to provide better maintenance access in the future next to an existing access road with a flatter surrounding work area and to place them farther from the planned group campground in Sibley Volcanic Regional Preserve. The length of this portion of the alignment with the angle would increase the overall total approximately 5-mile line length by approximately 100 feet.

No Project Alternative. Under the No Project Alternative, the existing Moraga–Oakland X lines would not be replaced. Lifecycle updates of line structures would not be completed, leading to future reliability issues and potentially unsafe operations. Lifecycle updates would occur in a piecemeal fashion for years driven by ongoing inspections that identify maintenance issues, including additional aging structure replacement. NERC recommendations to the industry for clearance and wildfire risk reduction would be implemented with each structure replacement over an indeterminate amount of time.

6.1.2 Comparison Approach

As discussed in Sections 5.1 through 5.20, the proposed project will not result in significant impacts. Nevertheless, alternatives were identified that could reduce one or more of the less-than-significant impacts. Therefore, the comparison of impacts focuses on the following environmental resources of concern to the community and environmental resources that distinguish among the alternatives:

- Aesthetics
- Air Quality
- Biological Resources
- Geology, Soils, and Paleontological Resources
- Noise
- Transportation
- Wildfire

For the resource topics Agriculture and Forestry Resources; Cultural Resources; Energy; Greenhouse Gas Emissions; Hazards, Hazardous Material, and Public Safety; Hydrology and Water Quality; Land Use and Planning; Minerals; Population and Housing; Public Services; Tribal Cultural Resources; and Utilities and Service Systems, either the proposed project has no impacts, or the impacts would not distinguish among the alternatives. These resource areas are not discussed further in this chapter.

No field visits, visual simulations, fire risk calculations, or other studies were conducted to evaluate the alternatives; potential impacts were identified using existing documentation and data gathered or prepared for the proposed project unless otherwise noted. Key assumptions for the impact analysis of the alternatives include the following:

- Alternatives would include implementation of all applicable APMs discussed in Sections 5.1 to 5.20.
- Construction staging areas are assumed to be similar in size and would be located on available vacant land not in use at the time of construction. Laydown areas are assumed to be similar in areas.
- Because potential aesthetics construction (short-term) impacts would be temporary and generally of the same type for the proposed project and all alternatives, potential construction impacts associated with aesthetics are not discussed.
- Potential construction (short-term) impacts associated with air quality and noise are discussed in the context of the overall length of each alternative in comparison to the proposed project's length. All alternatives are located within the SFBAAB and fall under the jurisdiction of the BAAQMD.
- Where alternative replacement is in the same location and of the same type as the project, potential biological resources impacts are assumed to be the same. In other locations, it is assumed that structures, access roads, and construction areas would be sited judiciously to avoid waterways, wetlands, or rare plants. The BSA for the proposed project overlaps with large areas of the footprints of the alternatives and the botanical survey included the Lincoln Avenue component of Alternative A. The alternatives are located within the limits of the BAHCP; applicable measures from the BAHCP and the Bay Area Operations and Maintenance ITP would be implemented for all alternatives.
- Potential wildfire impacts associated with construction, such as overland travel, the use of equipment that may create sparks, and construction equipment and vehicles that contain combustible materials such as fuels and oils and ignition sources, generally would be the same for the proposed project and the alternatives, and the same APMs would be implemented. Wildfire construction impacts are not discussed further.
- O&M impacts for the alternatives are assumed to be similar to O&M impacts for the proposed project and typically would not distinguish among alternatives. They are not discussed except for Alternatives B and C. Potential O&M transportation impacts that would occur for Alternatives B and C are compared with the proposed project.
- As with to the proposed project, all alternatives would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b) regarding vehicle miles traveled.
- As with the proposed project, the potential for avian electrocution or accidental line collision would be minimized for all alternatives by rebuilding the electrical lines in accordance with avian-safe construction standards and PG&E's Avian Protection Plan. This is not discussed further for the alternatives.
- Permanent changes to aesthetics, geology, and wildfire could occur from alternatives and are discussed.
- No scenic vistas were identified in the viewshed of any alternative.

6.1.3 Proposed Project Impact Summary

The proposed project includes rebuilding the four PG&E existing 115 kV circuit lines and structures and implementing minor modifications to Moraga and Oakland X substations. Approximately 4 miles of the existing 5 miles of overhead lines will be rebuilt overhead and approximately 1 mile will be rebuilt in city streets. This section summarizes potential impacts of the proposed project. Refer to Sections 5.1 (Aesthetics), 5.3 (Air Quality), 5.4 (Biological Resources), 5.7 (Geology, Soils, and Paleontological Resources), 5.13 (Noise), 5.17 (Transportation), and 5.20 (Wildfire) for additional information, including environmental setting.

6.1.3.1 Proposed Project – Aesthetics Impacts

As discussed in Section 5.1, the project will not result in any significant impacts to aesthetics and no mitigation is required.

The proposed 115 kV power line rebuild will not substantially degrade the existing visual character or quality of the landscape setting. There are no specific recognized scenic vistas within the project viewshed. The perceived change from Interstate 580, the nearest designated state scenic highway approximately 600 feet west of the project, will be minor. Where the existing overhead lines will be replaced by underground lines, the removal of the existing towers, to the extent they are visible, will be a positive visual change. In most cases, structures along the alignment are only partially visible and from any one location where the project can be seen, views are, in many cases, limited to a single pair of structures. Only a few locations afford open (public) views of multiple project structures. Permanent visual change resulting from modifications to the existing PG&E alignment will be noticeable but largely incremental and will not substantially alter or degrade the existing visual character of the landscape within the project area. Intervening vegetation and built structures will fully or partially screen public views of the project to a large degree. For the most part, modifications to existing PG&E 115 kV lines will occur in a predominantly urban context, where established landscape features seen in public views include a variety of existing infrastructure, such as wood power poles and lattice power line structures. The rebuilt 115 kV power lines will use non-specular conductors and a dulled galvanized finish on the new project poles, reducing potential glare of power line components.

6.1.3.2 Proposed Project – Air Quality Impacts

As discussed in Section 5.3, the project will not result in any significant impacts to air quality and no mitigation is required.

The air emissions from construction of the project will result in a temporary increase in criteria air pollutants. Air quality emissions will occur within the SFBAAB under the jurisdiction of the BAAQMD. The BAAQMD has provided project-level thresholds of significance for criteria pollutants; project construction emissions will not exceed these limits. The project will not conflict with or obstruct implementation of the applicable air quality plan and will not result in a cumulatively considerable net increase in the nonattainment pollutants. Incorporation of APMs to manage dust and asbestos, if it occurs on structures to be removed, will further reduce construction emissions. Because the project involves the rebuilding of existing infrastructure, no change to current O&M activities is expected. For this reason, the change in operational air emissions from the project was not estimated but was instead presumed to be zero.

6.1.3.3 Proposed Project – Biological Resources Impacts

As discussed in Section 5.4, the proposed project will not result in any significant impacts to biological resources and no mitigation is required.

No special-status plant species were identified within the project footprint (direct impact area); however, there is potential for occurrence in later years of annual species not previously observed. The plant AMMs from the BAHCP will be implemented.

Several special-status wildlife species have the potential to occur within or in the vicinity of the project footprint: Crotch's bumble bee, Monarch butterfly, foothill yellow-legged frog, California red-legged frog, Northwestern pond turtle, Alameda whipsnake, pallid bat, Townsend's big-eared bat, Western red bat, San Francisco dusky-footed woodrat, Cooper's hawk, golden eagle, and birds protected under the MBTA and Fish and Game Code Section 3503. The incorporation of applicable measures from the BAHCP and the ITP, as well as project-specific APMs, further minimizes potential impacts.

Little riparian habitat and other sensitive communities exist in the BSA. Within the project footprint, riparian habitat occurs primarily along access roads and near Moraga Substation. The project will not impact any riparian habitat that it spans. Only minor trimming of riparian habitat will be necessary to provide construction equipment access. Trimming or removal of a small number of trees in coast live oak woodland along Dimond Canyon Park to accommodate replacement structures RN26 and RS26 also will occur. With implementation of measures from the BAHCP and ITP noted previously, both direct and indirect effects will be further minimized.

The project has been designed to avoid impacts on waterways and wetlands to the greatest extent feasible, and the project will not remove, fill, or result in the hydrologic interruption of waterways or wetlands. No direct impacts to aquatic resources are expected to occur. Implementation of the general measures from the BAHCP and ITP will minimize indirect adverse impacts to wetlands.

Wildlife may move through the BSA and use breeding habitat during work activities. The eastern section of the project footprint has been recognized as an important open space area and essential corridor/linkage by the California Department of Fish and Wildlife, the California Essential Habitat Connectivity Project, and the Critical Linkage Project. Construction may impede wildlife movement and degrade breeding habitat or nursery sites within and adjacent to work areas. Migratory birds may move through the BSA during work activities and may nest in the vicinity. Construction activities may temporarily degrade nesting habitat within the immediate vicinity of the work locations. Any potential effect is expected to be minimal based on the disturbed nature of many of the work locations and the large amount of surrounding habitat. These potential impacts will be further minimized through implementation of applicable measures from the BAHCP, ITP, and project-specific APMs.

There also is potential for avian interactions with PG&E power lines and structures, including collisions and electrocutions. Species of birds reported to be susceptible to collisions generally have a large body size, long wingspan, heavy body, and poor maneuverability. PG&E will minimize the potential for electrocution or accidental line collision by rebuilding the electrical lines in accordance with avian-safe construction standards and will implement the processes and procedures outlined in the PG&E Avian Protection Plan.

6.1.3.4 Proposed Project – Geology, Soils, and Paleontological Resources Impacts

As discussed in Section 5.7, the proposed project will not result in any significant impacts to geology, soils, or paleontological resources and no mitigation is required.

As discussed in Section 5.7, it is likely that the project area will be exposed to at least one moderate or greater earthquake located close enough to produce strong ground shaking in the project area. The greatest potential for strong seismic ground shaking within the project area comes from the Hayward Fault, which has produced moderate to large earthquakes during historical time. Proposed power line structures are not located above active traces of the fault. In addition, overhead power line spans will be designed to accommodate potential fault displacement between support structures. The project will incorporate APM GEO-1 to develop seismic design criteria and appropriate safety design measures.

The project generally is not within a known area of liquefaction hazard; however, localized areas of rated liquefaction potential occur within the project area. Although there is a low probability that conditions conducive to liquefaction will be encountered within the project alignment, the project will implement APM GEO-2, which will minimize liquefaction and associated ground failure hazards such as lateral spreading that could be exacerbated by strong seismic ground shaking.

The project is located within a known landslide hazard area. No proposed project facilities, including overhead structures in the overhead portion of the alignment and power lines in the underground portion of the alignment, are located within a mapped landslide area. However, the proposed locations of two structures are above mapped landslides. The proposed deep foundations, including micropiles and caissons, will minimize the potential for impacts from shallow slope failure. Furthermore, the project will incorporate APM GEO-3 to include appropriate design measures for localized soil conditions.

Project impacts associated with erosion and loss of topsoil during construction will be minimized because of the limited areas that will be graded and disturbed, the temporary nature of construction, and the use of standard best management practices and dust control measures to minimize fugitive dust emissions and stormwater runoff. The project also will incorporate APM HYD-1, which requires development and implementation of a stormwater pollution prevention plan.

Expansive soils were identified in the Contra Costa County section of the project area. Replacement foundations in the overhead portion of the alignment will be either a group of micropiles with a pile cap or a single drilled-shaft reinforced-concrete caisson. In the underground portion of the alignment, a duct bank will be encased in 1.5-foot-thick thermal concrete located a minimum of 3 feet below the road surface. Neither the deep foundations to be used for the aboveground portion of the project nor the duct banks in the underground portion of the project are susceptible to damage from expansion and contraction of shallow soils.

Excavation activities deeper than 3 feet in four geological units in the project study area have high paleontological sensitivity and have high potential to encounter paleontological resources. For these construction activities, PG&E will implement APM PAL-1, which requires a qualified project paleontologist; APM PAL-2, which requires worker awareness training monitoring for all project excavation activities deeper than 3 feet below ground surface; APM PAL-3, which requires monitoring for select construction activities; and APM PAL-4, which requires recovery of paleontological resources.

6.1.3.5 Proposed Project – Noise Impacts

As discussed in Section 5.13, the proposed project will not result in any significant impacts to noise, so no mitigation is required.

Because construction activities will be conducted near residences, a temporary increase in noise will result. Although noise levels from construction activities at times may exceed noise limits established by local jurisdictions, construction of most project components at any given location will occur for a short period of time and will move between different points of the lines. Construction within each work area is anticipated to last from a few days to 2 to 3 weeks with intermittent and nonconsecutive days, further minimizing the total duration of elevated noise experienced by any one sensitive receptor. PG&E is exempt from local noise standards. Given the limited and intermittent duration of construction activity at any one location, impacts under this criterion will be less than significant with the implementation of APM NOI-1 through APM NOI-7.

Pile driving would be limited in duration and only be used for construction of the underground portion of the project if sheet piles are needed to stabilize vault excavations. These construction areas are expected to be far enough from buildings to not exceed vibration damage criteria. Nevertheless, APM NOI-8 will be implemented to require a vibration assessment that will consider site-specific factors and be incorporated into project construction. Impacts will be temporary and less than significant.

The replaced 115 kV power lines are not predicted to cause an exceedance of 45 A-weighted decibels at any noise sensitive receptor during foul weather conditions during the operational phase after construction. Proposed changes to Moraga Substation and to Oakland X Substation do not add transformer banks or any other new noise-producing equipment at the substations. Maintenance activities for the rebuilt power lines generally are expected to be the same as existing maintenance activities and typically will occur over short timeframes and generate minimal noise.

6.1.3.6 Proposed Project – Transportation Impacts

As discussed in Section 5.17, the proposed project will not result in any significant impacts to transportation, so no mitigation is required. The project will not conflict or be inconsistent with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Project construction traffic would temporarily increase traffic volumes on local roadways, arterials, and state highways, and most trips would occur when background traffic volumes are somewhat lower. The effects of these volume increases would be short term and periodic. Not all trips will affect the same roads, as crew members along with the necessary equipment will be working at multiple locations. When construction is completed, construction-related traffic will cease, and vehicle miles traveled will return to pre-existing conditions. The project will not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b).

Temporary road and lane closures are anticipated when certain sections of the PG&E lines are being removed or reconductored at the overhead road crossings and where lines will be installed underground. In some locations, road closures may last up to 2 weeks. Full closures at several locations along Montclair Railroad Trail also will likely last up to 2 weeks. Temporary interference with walking or bicycling accessibility may occur from temporary closures of sidewalks and trails along roadways. Any closures will be temporary and short term, and closures will be coordinated with Caltrans or local jurisdictions to reduce the impacts to potential temporary and short-term emergency access. PG&E will provide, as part of the Traffic Management Plan, notification to property owners and businesses in advance of work. In addition, where the installation of guard structures is required, APM TRA-1, which requires that traffic controls and other traffic safety measures be in place to maintain proper traffic flow, will further reduce potential impacts. Implementation of APM TRA-2 will restore all removed or damaged curbs, gutters, sidewalks, and paved surfaces, as necessary.

6.1.3.7 Proposed Project – Wildfire Impacts

As discussed in Section 5.20, the proposed project would not result in any significant impacts to wildfire, so no mitigation is required.

Portions of the project are in areas identified as very high FHSZs, including some in SRAs. Construction activities, including work areas, staging areas, and laydown areas, and temporary access associated with rebuilding the power lines could cause a temporary increase in fire risks from overland travel, the use of equipment that may create sparks, and construction equipment and vehicles that contain combustible materials such as fuels and oils and ignition sources. However, PG&E will comply with all applicable California Health and Safety Codes and ordinances regulating the handling, storage, and transportation of hazardous materials, which would help to minimize the potential for accidental conditions, including fire. Additionally, during construction, PG&E will implement APM WFR-1, Construction Fire Prevention Plan, and APM WFR-2, Fire Prevention Practices.

Construction vehicles and equipment are anticipated to access project construction areas by using existing PG&E access and paved roads, existing dirt access roads, or overland access. Construction vehicles and equipment needed at the pull sites will follow designated access routes and are expected to be parked or staged within the project ROW or alongside existing access roads. Two 4,000-gallon water trucks will be used during construction activities in unincorporated Contra Costa County, where fire hydrants and related fire suppression infrastructure are not present. Road closures will be coordinated with Caltrans or local jurisdictions to reduce the effects to potential temporary and short-term emergency access.

Completion of the project would replace aging structures with stronger, more fire-resistant structures and conductors. The results of the Wildfire Transmission Risk Model estimate a 90 percent reduction in wildfire risk from the project. The project will not have occupants and, therefore, will not potentially expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire caused by slope, prevailing winds, or other factors.

6.2 Potential Impacts of Alternatives

For each of the four alternatives to the proposed project, this section provides a summary of the existing setting and a description of potential impacts to the following resources: aesthetics; air quality; biological resources; geology, soils, and paleontological resources; noise; transportation; and wildfire. The analysis of each resource topic also provides a comparison to proposed project impacts.

6.2.1 Alternative A: Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground

6.2.1.1 Alternative A – Existing Setting

The environmental setting for Alternative A is similar to the proposed project setting where it would replace three of the four Moraga–Oakland X circuits in the existing alignment and construct the underground replacement portion with two circuits in Park Boulevard. These portions of Alternative A generally would be in the same locations; would be near the same sensitive receptors; would have the same habitats and potential special-status species present; would have the same soils and slopes; and would be in the same very high FHSZ as the proposed project.

The third underground circuit would be in Monterey Boulevard, Lincoln Avenue, MacArthur Avenue, and other streets, all of which generally are relatively flat and developed urban streets similar to Park Boulevard. The roads are adjacent to residential areas and near several schools, including Growing Light Montessori School, Head-Royce School, and Sequoia Elementary School. Vegetation and trees are present along both sides of these roads. A portion of this underground circuit would be in a very high FHSZ.

The additional aboveground portion of Alternative A between Moraga and Claremont substations (approximately 3.1 miles) is located primarily within open space, including in the EBRPD and East Bay Municipal Utility District, with undulating open grass areas and woodland greenbelts in the East Bay Hills. The existing alignment crosses over several hiking and recreation trails, including the Skyline Trail, Quarry Road, Pond Trail, and Volcanic Trail, and several roadways, including Skyline Boulevard and Grizzly Peak Road, which are Alameda County designated scenic routes. Near Moraga Substation, Alternative A is adjacent to a low-density residential area. Near Claremont Substation, Alternative A passes through an area of low-density residential development adjacent to City of Oakland ball fields. The Temescal Regional Recreation Area and Lake Temescal are located immediately west of Claremont Substation. SR 24 is located just north and SR 13 just east of Claremont Substation. This part of Alternative A is in areas identified as very high FHSZ.

The area through which the Moraga–Claremont portion of Alternative A would cross contains steep slopes that may be subject to landslides, may contain expansive soils and soils with liquefaction potential, may be near or cross fault zones, and may contain soils with high paleontological sensitivity and high potential to encounter paleontological resources.

Surveys completed for the proposed project's BSA overlap with areas along and near the Moraga–Claremont reconductoring portion of Alternative A. Based on those survey results, vegetation types along this part of Alternative A include coast live oak, moderate grasslands, and eucalyptus. The eastern section of the Moraga–Claremont replacement is within Alameda whipsnake critical habitat and BAHCP modeled habitat for California red-legged frog potential breeding and Alameda whipsnake movement. Because no critical habitat for plants was identified within 5 miles of the proposed project, critical habitat for plants would not be expected to occur in the footprint of Alternative A.

6.2.1.2 Alternative A – Aesthetics Impacts

The impacts to visual resources from Alternative A would be similar to the proposed project where it would replace three of the four Moraga–Oakland X circuits, remove the existing lines, and construct two underground single-circuit lines in Estates Drive/Park Boulevard. Permanent visual change resulting from replacement of three of the four existing PG&E circuits between Moraga and Oakland X substations would be incrementally better than the proposed project but would not substantially alter or degrade the existing visual character of the landscape, as with to the proposed project. As with the proposed project, Alternative A would result in a positive visual change between the intersection of Estates Drive and Park Boulevard and Oakland X Substation, where the existing overhead line will be replaced by underground lines. Between Monterey Boulevard and Park Boulevard, Alternative A would have one set of structures and associated conductors instead of the proposed project with two sets of structures and associated conductor, resulting in a minor improvement to visual character compared to the proposed project at this location. Alternative A would have a different transition structure location compared to the proposed project, with a single-circuit structure at Monterey Boulevard just west of SR 13 for the underground portion of the third circuit. The third underground single-circuit would be in Monterey Boulevard/Lincoln Avenue/MacArthur Avenue and other roadways to reach Oakland X Substation. The transition structure would be noticeable and generally similar to existing power line structures in the same area.

Permanent visual change also would result from reconductoring two end sections of the Moraga–Claremont Circuits 1 and 2 115 kV lines, which would require replacement of conductors and would likely require associated replacement structures. This change would be noticeable by nearby residents and users of the recreational trails but would be largely incremental and similar to the replacement of structures and conductor along the proposed project. Because of this additional reconductoring, visual changes from Alternative A would occur over a wider area than the proposed project and would be seen by more residents and recreational trail users.

Alternative A would include implementation of APM AES-2, requiring the use of non-specular conductors and a dulled galvanized finish on new structures. Although its visual impacts would extend over a larger area than the proposed project, Alternative A would be expected to result in less visual impacts than the proposed project at the local scale.

6.2.1.3 Alternative A – Air Quality Impacts

Localized construction air quality impacts from Alternative A would be similar to the proposed project because similar construction activities and equipment would be used. Alternative A also would implement applicable air quality APMs, as with to the proposed project. However, because of the greater length of Alternative A compared to the proposed project, total air emissions from Alternative A construction would be greater and more sensitive receptors could be affected compared to the proposed project.

6.2.1.4 Alternative A – Biological Resources Impacts

The impacts to biological resources from Alternative A would be similar to the proposed project where it would replace three of the four Moraga–Oakland X circuits, remove the existing lines, and construct the underground single-circuit lines in Estates Drive/Park Boulevard. The same biological resources APMs would be implemented.

Depending on the location of existing utilities in Monterey Boulevard, Lincoln Avenue, and MacArthur Avenue, trimming or removal of existing vegetation, including native and non-native trees, may be required along these roads. Palo Seco Creek crosses under Monterey Boulevard and Sausal Creek crossed under MacArthur Boulevard and may be impacted during construction of the third underground circuit unless a horizontal directional drill or other trenchless construction was possible.

The vegetation and habitats along the reconductoring of the two circuits between Moraga and Claremont substations likely are similar to the proposed project. Vegetation removal may be required to access structures and to prepare staging areas and helicopter landing zones. Construction activities for this overhead reconductoring would be similar to construction activities for the proposed project. Because of the greater length of Alternative A from the additional underground alignment and Moraga–Claremont reconductoring, Alternative A would result in greater vegetation and tree removal than the proposed project. Alternative A also could result in impacts during construction to Palo Seco Creek and Sausal Creek that would not occur with the proposed project.

6.2.1.5 Alternative A – Geology, Soils, and Paleontological Resources Impacts

Because of the similar setting and similar construction activities, the impacts to geology, soils, and paleontological resources from Alternative A would be similar to the proposed project for the portion associated with replacing three of the four Moraga–Oakland X circuits, removing the existing lines, and constructing the underground single-circuit lines in Estates Drive/Park Boulevard, as well as reconductoring the Moraga–Claremont lines. Impacts from seismic hazards, expansive soils, landslides, and liquefaction in these portions of Alternative A would be similar to the proposed project and the same geology APMs would be implemented where applicable. Paleontology APMs would be implemented in any areas with high paleontological sensitivity where soil disturbance below 3 feet would occur with a drill diameter wider than 3 feet.

The third underground circuit would be in Monterey Boulevard, Lincoln Avenue, MacArthur Avenue, and other streets, all of which generally are relatively flat and would not be expected to be subject to landslide issues. However, the third underground circuit alignment would cross the Hayward Fault along Monterey Boulevard and again along Lincoln Avenue. Underground power lines paralleling or crossing the Hayward Fault underground would need to accommodate fault creep and seismic displacement measured in feet, rather than inches, for a typical underground line to accommodate the maximum credible earthquake. An innovative, unprecedented design would be required to conceptually accommodate the movement of the lines expected from the maximum credible earthquake on the Hayward Fault. This degree of displacement likely would require construction of a tunnel (approximately 10-foot diameter or more) with tracks from which the cables would hang. The tracks would move to accommodate a potential range of displacement. Construction of such a tunnel would be extremely costly and would have residual reliability risk. The cable may not be able to withstand the potential degree of displacement. The length of the section crossing under the fault would make locating and addressing damage to the line more difficult, leading to longer outages. The resulting third underground circuit may not be sufficiently reliable. Such an underground crossing of the Hayward fault that would be imprudent and contrary to accepted engineering practice. PG&E is not aware of any tested engineering solution to the dangers of an underground power line crossing an active fault with the potential fault creep and coseismic displacement measured in feet. Because of these geotechnical conditions, an underground line crossing the Hayward Fault is considered to present significant and unavoidable geology impacts.

6.2.1.6 Alternative A – Noise Impacts

Localized construction noise impacts from Alternative A would be similar to the proposed project because similar construction activities and equipment would be used. Horizontal directional drilling, if used to cross Sausal Creek and Palo Seco Creek, would create noise levels at 50 feet similar to other proposed construction equipment. Alternative A also would implement applicable noise APMs, as with the proposed project. However, because of the greater length of Alternative A compared to the proposed project, noise impacts from Alternative A construction would be more widespread and more sensitive receptors could be affected compared to the proposed project.

6.2.1.7 Alternative A – Transportation Impacts

The impacts to transportation from Alternative A would be similar to the proposed project for the portion where it would replace three of the four Moraga–Oakland X circuits, remove the existing lines, and construct two underground single-circuit lines in Estates Drive/Park Boulevard. Temporary road and lane closures are anticipated when certain sections of the lines are being removed or reconductored at the overhead road crossings and where lines will be installed underground. In some locations, road closures may last up to 2 weeks. Full closures at several locations along Montclair Railroad Trail also will likely last up to 2 weeks. Guard structures would be installed where the alignment crosses roads or trails. APM TRA-1, which would require that traffic controls and other traffic safety measures be in place to maintain proper traffic flow, and APM TRA-2, which would restore all removed or damaged curbs, gutters, sidewalks, and paved surfaces, would be implemented to further minimize impacts.

Similar temporary lane and road closures also would occur along Monterey Boulevard, Lincoln Avenue, MacArthur Avenue, Excelsior Avenue, Kingsley Street and Park Boulevard Way during construction of the third underground circuit. APM TRA-1 and APM TRA-2 also would be implemented.

For the Moraga–Claremont reconductoring, guard structures would be installed where the alignment crosses roads or trails. Existing trails and roads in the open space areas may have minor improvements installed and be used for construction access. Where structures to be replaced cannot be accessed by roads, helicopters would be used for construction.

Because of the greater length of Alternative A compared to the proposed project, transportation impacts from Alternative A construction would be more widespread and more temporary road and trail closures would occur compared to the proposed project.

6.2.1.8 Alternative A – Wildfire Impacts

Completion of the project would replace aging structures with stronger, more fire-resistant structures and conductors on both the Moraga–Oakland X circuits and the Moraga–Claremont circuits, as with the proposed project. Although the wildfire risk reduction was not calculated for Alternative A, the wildfire risk reduction from Alternative A on the Moraga-Oakland X circuits likely would be similar to the proposed project because it is upgrading the same infrastructure. In addition, upgrades on the Moraga-Claremont circuits likely would result in some reduction in wildfire risk in the surrounding area. Alternative A would not have occupants and, therefore, would not potentially expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire caused by slope, prevailing winds, or other factors. Because Alternative A would reduce fire risk along both the Moraga–Oakland X and Moraga–Claremont lines, it would provide fire risk reduction in a larger area than the proposed project.

6.2.2 Alternative B: Manzanita Drive-Colton Boulevard-Estates Drive Underground

6.2.2.1 Alternative B – Existing Setting

The environmental setting for Alternative B is similar to the proposed project setting. It has the same location as the proposed project in the eastern section for structure removal and replacement and in the central and western sections for the removal of the existing lines and for construction of the underground lines on Park Boulevard. These portions of Alternative B generally would be in the same locations, would be near the same sensitive receptors, would have the same habitats and potential special-status species present, would have the same soils and slopes, and would be in the same very high FHSZ as the proposed project.

The additional underground portion in the central section of Alternative B includes construction in Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road and Estates Drive. These roadways and the transition station location are in residential areas, including hillside residential, interspersed with recreational open space preserves. Mountain Boulevard, a north-south arterial that runs parallel to SR 13 and has two to four lanes, passes through a commercial area in the village of Montclair. The others are local roads and are narrow and windy with limited straight sections. The predominant vegetation type along these roads is urban/developed, likely with some areas of coast live oak woodland, non-native ornamental, and eucalyptus trees, as with to the proposed project. No additional wetlands or waters were identified in this area. This area of Alternative B likely would have similar conditions associated with expansive soils, soils with liquefaction potential, and soils with high potential to encounter paleontological resources. In addition, these roads pass by or through several areas susceptible to landslides.

6.2.2.2 Alternative B – Aesthetics Impacts

As with to the proposed project, permanent visual change resulting from Alternative B from replacement of structures aboveground in the eastern section would be noticeable but largely incremental and would be similar to the proposed project. Alternative B would include implementation of APM AES-2 requiring the use of non-specular conductors and a dulled galvanized finish on new structures.

As described in Chapter 4, Alternative B would include a transition station at the west end of the underground segment in an area with commercial parking lots with existing road access. The transition station would occupy approximately 0.5 acres. Riser poles would be required where the lines transition to underground near Manzanita Drive and on the west side of SR 13. An example transition station is shown on Figure 4.2-8. The new transition station required for this alternative would result in visual changes at a location not affected by the proposed project. The new riser poles near Manzanita Drive and west of SR 13 also would be new structures that would result in a visual change that does not occur with the proposed project. Therefore, at the transition station location and riser pole locations, Alternative B would result in greater impacts to aesthetics than the proposed project.

A greater portion of the alignment, a total of approximately 3.4 miles, would be replaced underground compared to the proposed project. These underground duct banks would be in sections of Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, and, after crossing over SR 13, in Sims Drive, Somerset Road and Estates Drive. In these areas in the central and western sections, the removal of the existing power line structures, to the extent they are visible, would be a positive visual change.

However, existing conditions of Manzanita Drive, Colton Boulevard, Heartwood Drive, Sims Drive, Somerset Road and Estates Drive could require modifications affecting visual character. As described in Chapter 4, these roads may need to be widened, retaining walls constructed, and trees and vegetation removed, which would impact aesthetic resources. Several roads, including Manzanita Drive and Colton Boulevard, are in areas of significant grade change and landslide susceptibility. In some locations, to meet design and reliability requirements, large retaining walls may be needed to protect the underground lines from ground movement. Retaining walls could be high enough to be visible beyond the immediate roadway. Construction of the retaining walls would require removal of trees and vegetation. The change from trees and vegetation to large, engineered structures would result in a negative impact to aesthetic resources. Soils data would be needed prior to completing project design to identify areas at risk and determine the size and location of retaining walls. Creation of access to, and drilling equipment work areas in, residential yards would be required to obtain the soils data.

Although the removal of power line structures and conductors between Manzanita Drive and Park Boulevard would create a positive visual change at those locations, Alternative B's modifications to Manzanita Drive, Colton Boulevard, Sims Drive, Somerset Road and Estates Drive could result in greater impacts to visual character in other locations that would not occur with the proposed project. Treatments to retaining walls that reduce their visibility and revegetation where substantial earth disturbance has occurred could reduce impacts.

6.2.2.3 Alternative B – Air Quality Impacts

Localized construction air quality impacts from Alternative B would be similar to the proposed project in the eastern section for structure removal and replacement and in the central and western sections for the removal of the existing lines and construction of the underground lines on Park Boulevard because similar construction activities and equipment would be used. However, construction of the underground alignment on Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road and Estates Drive, as well as construction of the transition station and additional riser poles, would result in a longer construction duration and greater earth disturbance in the central section than the proposed project and would generate greater air emissions from dust and construction equipment than the proposed project. Alternative B would implement applicable air quality APMs, as with to the proposed project.

6.2.2.4 Alternative B – Biological Resources Impacts

The impacts to biological resources from Alternative B generally would be the same as the proposed project in the eastern section and in the western section where the existing lines would be removed and the underground portion in Park Boulevard constructed. Similar impacts to special-status species, riparian habitat, and coast live oak woodland would occur in this area.

Depending on location of any existing utilities and the site-specific geotechnical issues in Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road, and Estates Drive, trimming or removal of existing vegetation, including native and non-native trees, may be required along these roads. The number and species of trees and vegetation that would be removed cannot be determined at this time without extensive soil sampling and detailed design and engineering, but it would be greater than the proposed project.

6.2.2.5 Alternative B – Geology, Soils, and Paleontological Resources Impacts

The impacts to geology, soils, and paleontological resources from Alternative B generally would be the same as the proposed project in the eastern section and in the western section where the existing lines would be removed and the underground portion in Park Boulevard would be constructed. Impacts from seismic hazards, expansive soils, landslides, and liquefaction in these portions of Alternative B would be similar to the proposed project. Paleontology APMs would be implemented in any areas with high paleontological sensitivity where soil disturbance below 3 feet would occur with a drill diameter of more than 3 feet.

As noted previously, Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road and Estates Drive pass by or through several areas susceptible to landslides, which expose this route to significant geological hazards. To prevent failure of an underground line from landslide, construction of underground lines in these areas would require retaining walls and other engineered stabilization in some locations, which may require acquisition of multiple residential properties and removal of buildings. Additionally, land use restrictions would be required for all upslope properties to avoid excess loading of the retaining walls or other load-bearing components of the underground line installation. For example, these restrictions could include no residential expansions, no accessory dwelling units, and no pools. Without retaining walls, the alternative would be subject to an unacceptable risk of failure. Alternative B, therefore, would result in greater geology impacts than the proposed project and these impacts could be significant.

6.2.2.6 Alternative B – Noise Impacts

Localized construction noise impacts from Alternative B would be similar to the proposed project in the eastern section for structure removal and replacement and in the central and western sections for the removal of the existing lines and construction of the underground lines on Park Boulevard because similar construction activities and equipment would be used. Alternative B would have less construction noise impacts along the existing alignment in the central section from Manzanita Drive to Park Boulevard than the proposed project, which would remove but not replace structures and conductors in this location. However, construction of the underground alignment on Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road and Estates Drive to replace the existing overhead alignment, as well as construction of the transition station and additional riser poles, would result in a longer construction duration and greater earth disturbance than the proposed project. These construction activities also would be in proximity to more residences than the proposed project. Therefore, Alternative B would result in greater noise impacts than the proposed project. Alternative B would implement applicable noise APMs, as with the proposed project.

6.2.2.7 Alternative B – Transportation Impacts

The impacts to transportation from Alternative B generally would be the same as the proposed project in the eastern section where the lines will be rebuilt in place and in the western section where the existing lines would be removed and the underground portion in Park Boulevard constructed. In these areas, temporary road closures of up to 2 weeks may occur. Transportation APMs similar to the proposed project would be implemented during construction.

Construction of the underground lines on Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road, and Estates Drive presents additional transportation challenges. As discussed in Chapter 4, the construction work areas would extend the width of the road, and possibly beyond, in numerous areas. Construction of Alternative B, therefore, likely would require full closure of some roads. Because the trucks that would carry precast vaults may not be able to navigate the narrow, winding roads, and because straight road segments of approximately 165 feet are needed to install precast vaults, it is expected that many of the vaults would have to be cast in place. This construction approach would extend the time required for full road closure. Installation of forms and concrete pouring for vault walls and floors would take approximately 3-4 weeks to complete. At the end of each work day, the vault pit could be plated to allow for traffic flow during non-construction hours. Road widening and retaining wall construction would further extend the duration of road closures. Although portions of Mountain Boulevard are wider with four lanes, closure of one or more lanes during construction could disrupt access to businesses along Mountain Boulevard in the Montclair Village.

Depending on the specific site conditions and design requirements, temporary road closure at a given location could last several weeks or more. Access to some residences may be limited or not possible during these times. Property owners may be required to use detours and alternate routes to get to and from their properties or, in cases of temporary inaccessibility, arrange for temporary relocation. Emergency access could be affected, particularly for Sims Drive and Somerset Road, which are deadend roads. Construction of Alternative B would have greater impacts to transportation than the proposed project. Detours and temporary relocation could reduce these impacts.

During O&M of Alternative B, the curvature of the roads could present risks while accessing vaults for maintenance. Some vaults would be located with significant road curves on either side, and some would be on a significant grade. These factors may make it more difficult to safely access the vaults for maintenance. Temporary full closure of Manzanita Drive, Colton Boulevard, Heartwood Drive, Sims Drive, Somerset Road, and Estates Drive may be required during some O&M activities. Depending on the duration, detours and temporary relocation may be required to reduce impacts of these closures. In addition, even with construction of retaining walls, a coseismic event could damage the underground duct bank in Manzanita Drive, Colton Boulevard, Heartwood Drive, Sims Drive, Somerset Road or Estates Drive, and repair could require months of construction activity that affects transportation. These O&M impacts would not occur with the proposed project.

6.2.2.8 Alternative B – Wildfire Impacts

Because of the greater construction activity in vegetated areas required for Alternative B compared to the proposed project, the risk of wildfire during construction would be greater for Alternative B than for the proposed project. The additional construction activity would result from the construction of the underground segment on Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road, and Estates Drive and the associated transition station, new riser poles, retaining walls, and relocated utilities.

Completion of Alternative B would replace aging structures with stronger, more fire-resistant structures and conductors, as with the proposed project. Alternative B would replace approximately 4.2 miles of the existing overhead lines by underground lines. Although the wildfire risk reduction was not calculated for Alternative B, it is likely that it would result in a substantial reduction in wildfire risk. Alternative B would replace more of the lines underground and would provide an incrementally greater reduction in wildfire risk than the proposed project during the O&M project phase.

As with to the proposed project, Alternative B would not have occupants and, therefore, would not potentially expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire caused by slope, prevailing winds, or other factors.

6.2.3 Alternative C: Shepherd Canyon Road Underground

6.2.3.1 Alternative C – Existing Setting

The environmental setting for Alternative C is similar to the proposed project setting. It has the same location as the proposed project in the eastern section and the eastern edge of the central section for structure removal and replacement. It also has the same location in the central and western sections for the removal of the existing lines and for construction of the underground lines on Park Boulevard. These portions of Alternative C generally would be in the same locations, would be near the same sensitive receptors, would have the same habitats and potential special-status species present, would have the same soils and slopes, and would be in the same very high FHSZ as the proposed project.

The additional underground portion in the central section of Alternative C includes construction in Saroni Drive and Shepherd Canyon Road. These roadways and the transition poles near Saroni Drive and Gunn Drive are in residential areas, including hillside residential, interspersed with recreational parks. Shepherd Canyon Road is a two-lane local road in Oakland that runs through a residential area and adjacent to Shepherd Canyon Park. It connects to Skyline Boulevard, Pinehurst Road, and Manzanita Drive at its northeast end and to Snake Road in the village of Montclair at its southwest end. Shepherd Canyon Road is designated as part of the existing bike network in Oakland (Oakland 2019). Saroni Drive is a narrow local road that is relatively straight where the underground segment would be located. The predominant vegetation type along Saroni Drive is urban/developed. Along Shepherd Canyon Road, vegetation includes coast live oak woodland, non-native ornamental, urban/developed, and eucalyptus trees. No additional wetlands or waters were identified in this area. This area of Alternative C likely would have similar conditions associated with expansive soils, soils with liquefaction potential, and soils with high potential to encounter paleontological resources. In addition, Shepherd Canyon Drive and Saroni Drive pass through areas susceptible to landslides. Refer to Figures 4.2-4b to 4.2-4d.

6.2.3.2 Alternative C – Aesthetics Impacts

As with to the proposed project, permanent visual change resulting from Alternative C from replacement of structures aboveground in the eastern section and part of the central section would be noticeable but largely incremental and would be similar to the proposed project. Alternative C would include implementation of APM AES-2 requiring the use of non-specular conductors and a dulled galvanized finish on new structures.

An additional approximately 1.1 miles of the alignment would be replaced underground compared to the proposed project. These underground duct banks would be in Saroni Drive and Shepherd Canyon Drive in the central section. The removal of this section of the existing power line structures, to the extent they are visible, would be a positive visual change.

Alternative C would include a new transition station where the lines transition from aboveground to underground at the City of Oakland Municipal Service Yard. The transition station would occupy approximately 0.5 acres. This new transition station would result in visual changes at a location not affected by the proposed project. An example transition station is shown on Figure 4.2-8. The existing site currently contains parking and several small one-story buildings and a fenced enclosure. The transition station would introduce four riser poles up to approximately 65 feet tall. The riser poles would be much more visible than the existing buildings and fenced enclosure. In addition, two new structures comparable in height to the proposed project structures would be constructed north of Shephard Creek. The new riser poles would be visible from Shepherd Canyon Park and surrounding areas; the new structures north of Shephard Creek may be visible from Shepherd Canyon Road or residential areas directly south. Therefore, in the vicinity of the transition station, Alternative C would result in greater impacts to aesthetics than the proposed project.

Four new riser poles approximately 65 feet tall would be constructed near the intersection of Saroni Drive and Gunn Drive, where Alternative C would transition from aboveground to underground. Currently, no power line structures are visible from this intersection and surrounding area. The addition of the riser poles would result in an aesthetic impact in the area that would not occur with the proposed project.

The existing conditions of Saroni Drive and Shepherd Canyon Road would require modifications because of the risk of landslides and narrow roadways. As described in Chapter 4, the roads may need to be temporarily or permanently widened in locations, retaining walls would be required, and trees and vegetation would have to be removed. Retaining walls could be high enough to be visible beyond the immediate roadway. Construction of the retaining walls and protection of the duct banks from root zones would require permanent removal of trees and vegetation. The collection of exploratory borings, described in Chapter 4, would be required to determine the size and location of retaining walls. Completing the borings would require bringing heavy construction equipment, including drilling rigs, onto residential properties, grading to provide vehicle access to get the drilling rigs to the sampling locations, and extensive vegetation removal. Land use restrictions would be required for all upslope properties to avoid excess loading of the retaining walls or other load-bearing components of the underground line installation. The change from roadside trees and vegetation to large, engineered structures would affect the visual character of the roads and result in a negative impact to aesthetic resources along most of the underground segment on Saroni Drive and Shepherd Canyon Road. Treatments to retaining walls that reduce their visibility and revegetation where substantial earth disturbance has occurred could reduce impacts.

Overall, Alternative C would result in positive visual changes in some locations compared to the proposed project and in negative aesthetic impacts in other locations compared to the proposed project.

6.2.3.3 Alternative C – Air Quality Impacts

Localized construction air quality impacts from Alternative C would be similar to the proposed project in the eastern section for structure removal and replacement and in the central and western sections for the removal of the existing lines and construction of the underground lines on Park Boulevard because similar construction activities and equipment would be used.

Construction of the underground segment in Saroni Drive and Shepherd Canyon Road, as well as construction of the transition station and additional riser poles, would result in a longer construction duration and greater earth disturbance than the proposed project and overall would generate greater air emissions from dust and construction equipment than the proposed project. Alternative C would implement applicable air quality APMs, as with to the proposed project.

6.2.3.4 Alternative C – Biological Resources Impacts

The impacts to biological resources from Alternative C generally would be the same as the proposed project in the eastern section and part of the central section, where existing lines and structures would be removed and replacement structures and lines installed, and in the western section where the existing lines would be removed and the underground portion in Park Boulevard would be constructed. Similar impacts to special-status species, riparian habitat, and coast live oak woodland would occur in these areas.

Construction of the underground segment in Saroni Drive and Shepherd Canyon Road, as well as construction of the transition station and additional riser poles, would result in potentially extensive removal of trees, shrubs, and other vegetation to complete the exploratory geotechnical investigation and construct retaining walls. Vegetation also would be removed to construct the two new structures south of Shephard Creek and the new transition station. The amount of vegetation removal in the central section would be greater than for the proposed project. In addition, Shephard Creek runs under Shepherd Canyon Road (Oakland Museum of California n.d.) and could be affected during construction, potentially requiring relocation. Overall, biological impacts of Alternative C would be greater than the proposed project.

6.2.3.5 Alternative C – Geology, Soils, and Paleontological Resources Impacts

The impacts to geology, soils, and paleontological resources from Alternative C generally would be the same as the proposed project in the eastern section and part of the central section, where existing lines and structures would be removed and replacement structures and lines would be installed, and in the western section, where the existing lines would be removed and the underground portion in Park Boulevard would be constructed. Impacts from seismic hazards, expansive soils, landslides, and liquefaction in these portions of Alternative C would be similar to the proposed project. Paleontology APMs would be implemented in any areas with high paleontological sensitivity where soil disturbance below 3 feet would occur with a drill diameter of more than 3 feet.

As noted previously, Saroni Drive and Shepherd Canyon Road pass through an area susceptible to landslides, which exposes this route to significant geological hazards. To prevent failure of an underground line from landslide, retaining walls would be required in some locations, which may require acquisition of multiple residential properties and removal of buildings. Additionally, land use restrictions would be required for all upslope properties to avoid excess loading of the retaining walls or other load-bearing components of the underground line installation. For example, these restrictions could include no residential expansions, no accessory dwelling units, and no pools. Without retaining walls, the alternative would be subject to an unacceptable risk of failure. Alternative C, therefore, would result in greater geological impacts than the proposed project and these impacts could be significant.

6.2.3.6 Alternative C – Noise Impacts

Localized construction noise impacts from Alternative C would be similar to the proposed project in the eastern section and part of the central section for structure removal and replacement and in the central and western sections for the removal of the existing lines and construction of the underground lines on Park Boulevard because similar construction activities and equipment would be used. Alternative C would have less construction noise impacts along the existing alignment in a portion of the central section than the proposed project where existing structures would be removed but not replaced. However, construction of the underground alignment on Saroni Drive and Shepherd Canyon Road as well as construction of the transition station, additional riser poles, and two new structures would result in a longer construction duration and greater earth disturbance than the proposed project in the central section. In particular, the construction equipment used for the exploratory geotechnical investigation and to construct retaining walls likely would generate noticeably greater noise for longer periods than the proposed project. Therefore, compared to the proposed project, Alternative C would result in comparable noise impacts in some locations, lesser noise impacts in some locations, and much greater noise impacts in some locations. Alternative C would implement applicable noise APMs, as with the proposed project.

6.2.3.7 Alternative C – Transportation Impacts

The impacts to transportation from Alternative C generally would be the same as the proposed project in the eastern section and part of the central section where the lines will be rebuilt in place, and in the western section where the existing lines would be removed and the underground portion in Park Boulevard would be constructed. In these areas, temporary road closures of up to 3 to 4 weeks may occur at specific locations to excavate and install underground vaults. Transportation APMs similar to the proposed project would be implemented during construction.

Construction of the underground lines on Saroni Drive and Shepherd Canyon Road presents additional transportation challenges. As discussed in Chapter 4, the construction work areas would extend beyond the width of one lane and the roads do not have shoulders in most locations. Construction of Alternative C, therefore, likely would require full closure of the roads. On Shepherd Canyon Road, construction work may be at one location for a period of time with the road closed at that location; as the construction work areas move, the location of the closure would move. Closures on Shepherd Canyon Road could last for several weeks to several months or longer, especially where large retaining walls are needed near the roadway. In some locations, because of road width or road curves, vaults may need to be cast in place, which also would extend the time required for full road closure. If feasible, at the end of each work day, vault pits or trenches for duct banks could be plated to allow for traffic flow during non-construction hours.

Shepherd Canyon Road is one of the larger northeast-southwest roads in the area that connect the hillside neighborhoods to SR 13 and Montclair Village. The nearest road of comparable size that connects the hillside neighborhoods to SR 13/Montclair Village is Thornhill Drive, approximately 0.6 mile northwest. Access to some residences may be limited or not possible during these times. Property owners may be required to use detours and alternate routes to get to and from their properties or, in cases of temporary inaccessibility, arrange for temporary relocation. Emergency access could be affected, including emergency vehicles from Oakland Fire Station No. 24 on Shepherd Canyon Road. Emergency vehicles from this station may need to divert to Thornhill Drive, Snake Road, Ascot Drive, or other roads to reach areas north of the station on Shepherd Canyon Road, taking longer to respond to some emergencies. Therefore, construction of Alternative C would have greater impacts to transportation than the proposed project. Detours and temporary relocation could reduce these impacts.

During O&M of Alternative C, the narrowness of Saroni Drive and Shepherd Canyon Road may require temporary full closure to safely access vaults. Depending on the duration, detours and temporary relocation may be required to reduce impacts of these closures. In addition, even with construction of retaining walls, a coseismic event could damage this segment of underground pipeline in Saroni Drive or Shepherd Canyon Road and repair could require months of construction activity that affects transportation. These O&M impacts would not occur with the proposed project.

6.2.3.8 Alternative C – Wildfire Impacts

Because of the greater construction activity in vegetated areas required for Alternative C compared to the proposed project, the risk of wildfire during construction would be greater for Alternative C than for the proposed project. The additional construction activity would result from the construction of the underground segment on Saroni Drive and Shepherd Canyon Road and the associated transition station, two new structures, new riser poles, retaining walls, and relocated utilities.

Completion of Alternative C would replace aging structures with stronger, more fire-resistant structures and conductors in the eastern section and parts of the central and western sections, as with to the proposed project. This would result in a similar substantial reduction in wildfire risk in these areas. As with to the proposed project, Alternative C would replace approximately 1.1 miles of overhead lines with underground lines in Park Boulevard and result in a similar reduction in wildfire risk in this area. For the approximately 1.1 mile of underground lines on Saroni Drive and Shepherd Canyon Road, Alternative C would result in an incrementally greater reduction in wildfire risk than the proposed project during the O&M phase.

As with to the proposed project, Alternative C would not have occupants and, therefore, would not potentially expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire caused by slope, prevailing winds, or other factors.

6.2.4 Alternative E: Proposed Project with Campground Overhead Option

6.2.4.1 Alternative E – Existing Setting

The environmental setting for Alternative E is the same as the setting for the proposed project because it has the same existing and proposed replacement alignment except near the planned EBRPD Sibley Volcanic Regional Preserve Group Campground, where two structures would be replaced northwest approximately 380 feet outside of the existing alignment. The location for these two structures would be within the same open space visual setting with the same vegetation type (coast live oak) as the proposed project. The structures would be in the same very high fire hazard severity zone as the proposed project. The two structures would be replaced on a flatter area adjacent to an existing access road and away from the existing structure locations on steeper slopes but otherwise have similar soils and geologic conditions as the related proposed project structures.

6.2.4.2 Alternative E – Aesthetics Impacts

Replacing two structures farther from the planned EBRPD Sibley Volcanic Regional Preserve Group Campground would result in a minor but noticeable long-term improvement in visual character of the immediate campground area where the lines span would be farther (approximately 160 feet) in the overhead view. However, the two structures would be at a higher elevation than the corresponding proposed project towers and would be more visible to hikers and other users of the Sibley Volcanic Regional Preserve and East Bay Skyline Trail (Bay Area Ridge Trail). In addition, more vegetation would need to be removed, along approximately 3,200 feet of the new alignment, compared to the proposed project for construction of these two new structures, and to comply with General Order 95. The additional vegetation removal would affect views of campground users and nearby hikers and trail users. Therefore, Alternative E would result in greater aesthetic impacts than the proposed project in the vicinity of these two structures.

6.2.4.3 Alternative E – Air Quality Impacts

Localized construction air quality impacts from Alternative E would be similar to the proposed project over most of the alignment because similar construction activities and equipment would be used. Alternative E also would implement applicable air quality APMs, as with to the proposed project. However, at the location of the planned EBRPD Sibley Volcanic Regional Preserve Group Campground, replacing two structures farther from the campground would increase the construction time and activity, primarily for vegetation removal, compared to the corresponding proposed project structures. Therefore, Alternative E would result in incrementally greater construction air emissions than the proposed project.

6.2.4.4 Alternative E – Biological Resources Impacts

Impacts to biological resources from Alternative E would be expected to be similar to the proposed project along nearly the entire alignment, and the same biological resource APMs would be implemented. At the location of the planned EBRPD Sibley Volcanic Regional Preserve Group Campground, replacing two structures farther from the campground generally would occur in the same type of habitat and have the same impacts as the proposed project in this area. However, an increase in vegetation removal and tree trimming or removal compared to the proposed project (an additional approximately 3,200 feet) may be required for construction and to meet General Order 95 clearance requirements in the new ROW in this area.

6.2.4.5 Alternative E – Geology, Soils, and Paleontological Resources Impacts

Impacts to geology, soils, and paleontological resources from Alternative E would be the same as the proposed project along nearly the entire alignment. Where the two structures would be replaced farther from the campground, applicable APMs would be implemented. Alternative E would incorporate APM GEO-1 to develop seismic design criteria and appropriate safety design measures; APM GEO-2 to minimize liquefaction and associated ground failure hazards; and APM GEO-3 to include appropriate design measures for localized soil conditions. Impacts would be similar to the proposed project.

6.2.4.6 Alternative E – Noise Impacts

Localized construction noise impacts from Alternative E would be similar to the proposed project over most of the alignment because similar construction activities and equipment would be used. Alternative E also would implement applicable noise APMs, as with to the proposed project. However, at the location of the planned EBRPD Sibley Volcanic Regional Preserve Group Campground, replacing two structures farther from the campground would increase the construction time and activity due to an increase in vegetation removal, compared to the corresponding proposed project structures. Therefore, Alternative E would result in incrementally greater construction noise impacts than the proposed project at this location.

6.2.4.7 Alternative E – Transportation Impacts

Impacts to transportation from Alternative E would be nearly the same as for the proposed project. Temporary road and lane closures may occur when certain sections of the lines are being removed or reconductored at the overhead road crossings and where lines will be installed underground. In some locations, road closures may last up to 2 weeks. Guard structures would be installed where the alignment crosses roads or trails. Similar construction access and road or trail closures as the proposed project would be done for replacement of the two structures farther from the planned EBRPD Sibley Volcanic Regional Preserve Group Campground. The project would include APM TRA-1 and APM TRA-2 to further minimize impacts. Transportation impacts of Alternative E would be similar to the proposed project.

6.2.4.8 Alternative E – Wildfire Impacts

Completion of Alternative E would replace aging structures with stronger, more fire-resistant structures and conductors, as with to the proposed project. Because all the structures except two would be replaced in the same locations and with the same types of structures as the proposed project, and two structures would be replaced approximately 160 feet away, it is expected that the reduction in wildfire risk would be the same as the proposed project. Alternative E would implement the same wildfire APMs as the proposed project. Wildfire impacts of Alternative E would be the same as the proposed project.

6.3 Alternatives Ranking

CEQA Guidelines Section 15126.6(e) states that "if the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

Table 6.2-1 compares the impacts of the alternatives to the proposed project impacts for aesthetics, air quality, biological resources, geology and soils, noise, transportation, and wildfire. As discussed in Section 6.1.2, for the other environmental resource topics, either the proposed project has no impacts, or the impacts would not distinguish among the alternatives The alternatives are listed from left to right in order of increasing impacts. As shown in Table 6.2-1, the proposed project would be the environmentally superior alternative because the impacts of the alternatives would be greater for several environmental resources with only incremental, if any, improvements to aesthetics or wildfire.

Table 6.2-1. Alternatives Comparison Summary and Ranking

Environmental Resource	No Project Alternative	Alternative E: Proposed Project with Campground Overhead Option	Alternative A: Moraga–Oakland X 3-Circuit with Moraga–Claremont and Park Blvd/Lincoln Ave[a]	Alternative B: Manzanita Drive-Colton Blvd-Estates Drive Underground	Alternative C: Shepherd Canyon Road Underground
Aesthetics	↑	↑	↓	=	=
Air Quality	=	↑	↑	↑	↑
Biological Resources	=	↑	↑	↑	↑
Geology and Soils	=	=	↑	↑	↑
Noise	=	↑	↑	↑	↑
Transportation	=	=	↑	↑	↑

Table 6.2-1. Alternatives Comparison Summary and Ranking

Environmental Resource	No Project Alternative	Alternative E: Proposed Project with Campground Overhead Option	Alternative A: Moraga–Oakland X 3-Circuit with Moraga–Claremont and Park Blvd/Lincoln Ave[a]	Alternative B: Manzanita Drive-Colton Blvd-Estates Drive Underground	Alternative C: Shepherd Canyon Road Underground
Wildfire	↑	=	↓	↓	↓

[a] The complete name is Alternative A: Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground.

↑ indicates impacts are relatively greater than the proposed project impacts.
↓ indicates impacts are relatively less than the proposed project impacts.
= = indicates impacts are similar to the proposed project impacts.

The No Project Alternative would individually replace aging structures over time. Ultimately, all structures and the conductors would be replaced, resulting in similar localized construction impacts as the proposed project to air quality, biological resources, noise, and transportation. However, the No Project Alternative would delay the substantial wildfire risk reduction of the proposed project for many years. In addition, the visual improvements from the proposed project from replacing a portion of the overhead lines underground in the western section would not occur with the No Project Alternative.

Alternative E, the Proposed Project with Campground Overhead Option Alternative, generally would have the same impacts as the proposed project except for the different replacement location of two towers near the planned EBRPD Sibley Volcanic Regional Preserve Group Campground. Compared to the proposed project at this location, Alternative E would result in increased localized impacts to air quality and noise during construction; greater aesthetic impacts because of visibility to more visitors to Sibley Volcanic Regional Preserve and East Bay Skyline Trail (Bay Area Ridge Trail); and greater biological impacts from the removal of more trees and vegetation.

Alternative A, the Moraga–Oakland X 3-Circuit Replacement with Moraga–Claremont Reconductoring and Park Boulevard/Lincoln Avenue Underground Alternative, would result in wildfire risk reduction over a greater area than the proposed project. Alternative A also would result in a minor improvement in aesthetics compared to the proposed project along the existing alignment between Monterey Boulevard and Park Boulevard. However, Alternative A has a much larger footprint than the proposed project with the additional underground construction on Monterey Boulevard, Lincoln Avenue, MacArthur Avenue, and other streets and the reconductoring of most of the Moraga–Claremont power lines. As a result, Alternative A would result in overall greater impacts to air quality, biological resources, noise, and transportation than the proposed project. The third underground circuit along Monterey Boulevard and Lincoln Avenue would cross the Hayward Fault twice. Because of the associated geotechnical conditions and the need for an innovative, unprecedented design, an underground line crossing the Hayward Fault is considered to present a potential significant and unavoidable geology impact.

Alternative B, the Manzanita Drive-Colton Boulevard-Estates Drive Underground Alternative, would result in an incrementally greater reduction in wildfire risk than the proposed project. It also would place a greater length of the power lines underground, potentially resulting in improvements to the visual character of the area where the existing overhead lines are currently located, benefiting some residents and public road users. However, construction along Manzanita Drive, Colton Boulevard, Heartwood Drive, Sims Drive, Somerset Road, and Estates Drive could result in road widening and retaining wall construction, as well as creation of new visible transition station and riser poles. These changes likely would substantially alter the visual character in multiple locations and would result in greater visual impacts to views of other residents and public road users than Alternatives A and E and the No Project Alternative. These construction activities also could result in extensive vegetation removal and greater biological impacts than Alternatives A and E and the No Project Alternative. The underground portion on Manzanita Drive, Colton Boulevard, Heartwood Drive, Mountain Boulevard, Sims Drive, Somerset Road, and Estates Drive could result in significant geology impacts because the roads are in areas susceptible to landslides and are exposed to significant geological hazards.

Alternative C, the Shepherd Canyon Road Underground Alternative, would result in an incrementally greater reduction in wildfire risk than the proposed project. It also would place a greater length of the power lines underground, potentially resulting in improvements to the visual character of the area where the existing overhead lines are currently located, benefiting some residents and public road users. However, construction along Saroni Drive and Shepherd Canyon Road would result in retaining wall construction in some locations, possible road widening in some locations, and creation of visible new transition station, power line structures, and riser poles. These changes likely would substantially alter the visual character in multiple locations and would result in greater visual impacts to views of other residents and public road users than any of the other alternatives. These construction activities also could result in extensive vegetation removal and greater biological impacts than any of the other alternatives. The underground portion on Saroni Drive and Shepherd Canyon Road could result in significant geology impacts because the roads are in areas susceptible to landslides and are exposed to significant geological hazards.

7. Cumulative Impacts and Other CEQA Considerations

This section discusses potential cumulative impacts related to the Moraga–Oakland X 115 kV Rebuild Project. Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. A cumulative impact is the change in the environment that results from the incremental impact of a project when added to other closely related past, present, or reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant impacts occurring over time.

An analysis of potential cumulative impacts for each relevant resource topic is provided in Section 7.1.3, immediately following Table 7.1-1, which lists projects within approximately 2 miles of the project area. The projects listed in Table 7.1-1, developed from available information on websites, were included if they had potential environmental impacts, geographic scope and location, or timing and duration of implementation similar to those of the Moraga–Oakland X 115 kV Rebuild Project. The analysis considered the potential cumulative impacts that could result when impacts of the proposed project are considered in combination with impacts of other past, present, and reasonably foreseeable future projects. Some reasonably foreseeable future projects listed in Table 7.1-1 might not be approved or could be modified prior to approval; however, for the purpose of this analysis, approval and construction of identified projects was assumed.

7.1 Cumulative Impacts

Projects included in the cumulative impact assessment were identified by using a list approach (CEQA Guidelines Section 15130(b)(1)(A)), including all pending development projects within an approximately 2-mile radius of the project area. This area includes portions of unincorporated Contra Costa County and the cities of Orinda, Oakland, and Piedmont. Table 7.1-1 summarizes these pending development projects.

7.1.1 List of Cumulative Projects

Table 7.1-1 lists projects in the vicinity of proposed project components that may overlap with the proposed project's construction timeline. These projects also are shown on Figure 7.1-1. Information was gleaned from the City of Orinda, Contra Costa County, City of Oakland, City of Piedmont, EBRPD, EBMUD, BART, Caltrans, and other sources such as the Office of Planning and Research CEQANet website. For some projects in Table 7.1-1, construction schedule information was not available. For the purposes of the cumulative impact analysis, it was assumed the construction schedule would overlap with the proposed project construction.

Potential PG&E projects identified in the CAISO TPP[28] and CAISO Transmission Development Forum[29] were not included in the list of cumulative projects. PG&E's Oakland Clean Energy Initiative included in CAISO's 2017-2018 TPP is still a conceptual proposal that is expected to be updated by CAISO as it considers the changes in the region's load forecast. Other project scopes within the Northern Oakland Area Reinforcement that PG&E submitted as part of CAISO's 2019-2020 TPP in September 2019 are at least 2 to 3 years behind the proposed project if they were to move forward with CAISO approval, and construction impacts would not overlap. Potential PG&E projects involving Moraga or Oakland X substations on an "Approved Projects" list associated with CAISO's Transmission Development Forum meeting on July 31, 2024, are either in service, on hold, are noted as to be determined (TBD), or they are having their in-service date recalibrated. The projects may not be needed, or may be modified, to accommodate the reasonably foreseeable future energy demands of the region discussed in

[28] https://www.caiso.com/generation-transmission/transmission/transmission-planning

[29] https://www.caiso.com/meetings-events/topics/transmission-development-forum

Section 2.1.2. At this time, it is unknown if these projects will overlap with the proposed project construction and, therefore, they are not included in the cumulative impact analysis.

Table 7.1-1. Cumulative Projects in the Project Vicinity

Map No.	Project Name	Description/Location	Location in Relation to the Proposed Project	Project Status and Construction Duration	Source of Project Information
1	Wilder Subdivision	The Wilder subdivision (formerly Montanera) is a planned development in the Gateway Valley at the southern end of the City of Orinda at State Route 24 and Wilder Road. Construction of new single-family residences in the subdivision is almost complete.	Approximately 400 feet between the nearest undeveloped lot and project work area (a helicopter landing zone) and approximately 0.8 mile from the power lines	As of November 2023, construction on 230 of the 245 home sites has been completed.	City of Orinda Major Development Projects website: https://www.cityoforinda.org/281/Wilder-Subdivision
2	Country House Memory Care Project	The Countryhouse Memory Care project at 1 Wilder Road in the City of Orinda proposes a one- to two-story, 32,084-square-foot building with 38 assisted-living units, a parking area with 16 parking spaces, a vehicle turn-around adjacent to the front and delivery entrances, and landscaping.	Approximately 0.8 mile from the nearest staging area and approximately 1.8 mile from the power lines	Construction is expected to start in September 2024.	City of Orinda Major Development Projects website: https://www.cityoforinda.org/418/Countryhouse-Memory-Care-Project-1-Wilde
3	2805 Park Boulevard Mixed-Use Building	The development, proposed for 2805 Park Boulevard in the City of Oakland, would be a six-story mixed-use building consisting of a ground floor lobby and 20 apartment units; tree removal and replacement; installation of landscaping throughout the site; and minor site modification.	Approximately 0.5 mile from Oakland X Substation	As of December 2023, it is approved pending appeal.	Oakland City Planning Commission: https://oaklandca.s3.us-west-1.amazonaws.com/view/oak057927.pdf
4	500 Grand Avenue Project	Redevelopment of a vacant parking lot at 500 Grand Avenue in the City of Oakland with a mixed-use commercial and residential building with 40 residential units.	Approximately 1.1 miles from Oakland X Substation	As of December 2023, the permit had been extended.	500 Grand Avenue Project CEQA Analysis: https://oaklandca.s3.us-west-1.amazonaws.com/oakca1/groups/ceda/documents/report/oak062394.pdf
5	East 18th Street Mixed-use Project	New multi-family mixed-use project proposed at 347 East 18th Street in the City of Oakland. It would include 27 residential units.	Approximately 1.2 miles from Oakland X Substation	As of December 2023, the project is approved pending appeal.	SF YIMBY website: https://sfyimby.com/2022/08/permits-approved-for-347-east-18th-street-merritt-oakland.html
6	Brooklyn Basin Development	Signature Development Group is creating more than 3,000 new apartments surrounded by retail and public parks at full buildout at 845 Embarcadero in the City of Oakland. It includes 3,100 residential units, 200,000 square feet of ground-floor commercial space, several marinas, and 30 acres of public parks.	Approximately 1.7 miles from Oakland X Substation	Construction of first two phases complete. Completion of phase three by 2024, and phase four by 2027.	SF YIMBY: https://sfyimby.com/2021/04/845-embarcadero-under-construction-parcel-a-rising-in-brooklyn-basin-oakland.html

Table 7.1-1. Cumulative Projects in the Project Vicinity

Map No.	Project Name	Description/Location	Location in Relation to the Proposed Project	Project Status and Construction Duration	Source of Project Information
7	Lake Merritt Transit-Oriented Development	Twin-block development at 51 9th Street and 107 8th Street surrounding the Lake Merritt BART Station in downtown Oakland. Includes 500,000 square feet of new office space, retail, and community amenities and 557 residential units.	Approximately 1.8 miles from Oakland X Substation	Construction is set to begin in 2024.	BART website: https://www.bart.gov/about/business/tod/lakemerritt
8	Head-Royce School Expansion Project	The Head-Royce School (4315 Lincoln Avenue in the City of Oakland) is proposing an expansion to extend the existing 14-acre campus across Lincoln Avenue to the site of the former Lincoln Children's Center and to develop an integrated 22-acre campus serving a student population of 1,250 at maximum buildout.	Approximately 0.25 mile from nearest staging area	Final Environmental Impact Report was released February 2023.	City of Oakland: https://www.oaklandca.gov/projects/head-royce
9	Sibley Volcanic Regional Preserve Group Campground (Phase 2 of Alder Creek and Leatherwood Creek Restoration Project)	Construct a group campsite and permanent restroom facilities (Fiddleneck Field) near the EBRPD Eastport Staging Area at Pinehurst Road.	The location of the planned group campsite is adjacent to an existing overhead power lines span between ES9 and ES10 and a potential staging area and helicopter landing zone	FEIR certified in 2018. Construction of campsite has not started as of November 2024.	EBRPD website: https://www.ebparks.org/about-us/whats-new/news/park-district-celebrates-grand-opening-alder-creek-and-leatherwood-creek
10	39th Avenue Reservoir Replacement	EBMUD plans to replace the existing 39th Avenue Reservoir (near 39th Avenue and Selkirk Street in the City of Oakland) with a smaller reservoir to increase system reliability and improve water quality and operating efficiency.	Approximately 1.86 miles from structure ES29	The Mitigated Negative Declaration was certified by EBMUD's Board of Directors on January 22, 2013. Design is scheduled for 2027-2028 followed by construction in 2029-2030.	EBMUD: https://www.ebmud.com/about-us/construction-and-maintenance/construction-my-neighborhood/39th-avenue-reservoir-replacement
11	Central Reservoir Replacement Project	EBMUD is replacing its 154-million-gallon Central Reservoir on a 27-acre site located near 23rd Avenue and 31st Street in the City of Oakland. The old reservoir will be demolished and replaced with new concrete tanks that are approximately 20 feet higher than the existing reservoir.	Approximately 0.5 mile from Oakland X Substation	EBMUD Board of Directors approved the project and certified the EIR in April 2021. Construction for this project is expected to occur over a 6-year period, from 2026-2032.	EBMUD: https://www.ebmud.com/about-us/construction-and-maintenance/construction-my-neighborhood/central-reservoir-replacement-project

Table 7.1-1. Cumulative Projects in the Project Vicinity

Map No.	Project Name	Description/Location	Location in Relation to the Proposed Project	Project Status and Construction Duration	Source of Project Information
12	Piedmont Community Pool	Piedmont Community Pool in the City of Piedmont is under renovation and enhancement.	Approximately 1 mile from structure EN32	Under construction as of June 2024.	City of Piedmont: https://piedmont.ca.gov/cms/One.aspx?portalId=13659823&pageId=16935826#camera

7.1.2 Geographic Scope

Table 7.1-2 defines the geographic scope of analysis for each resource topic and why the scope is appropriate for each resource.

Table 7.1-2. Geographic Scope of Analysis for Cumulative Scenario

Resource Topic[a]	Geographic Scope
Aesthetics	Within 0.25 mile of the project. Intervening topography, vegetation, and, to a somewhat lesser degree, built structures limit visibility of project components to between a few hundred feet and approximately 0.25 mile along much of the project route.
Air Quality	The SFBAAB, which is under the jurisdiction of the BAAQMD. Some pollutant emissions could affect air quality throughout the basin.
Biological Resources	The BSA for the proposed project. The BSA includes biological resources that may be impacted by the project. The project is not likely to impact biological resources outside the BSA and, therefore, will not contribute to potential cumulative impacts.
Cultural Resources	The API for the proposed project. The project will not impact potential cultural resources outside the API and, therefore, will not contribute to potential cumulative impacts.
Energy	The state of California, which is the appropriate scale for evaluating wasteful energy use.
Geology, Soils, and Paleontological Resources	The project footprint. Impacts are site specific and generally do not extend beyond the project limits.
Greenhouse Gases	The state of California. The state has established reduction goals for greenhouse gases, which do not remain localized.
Hazards, Hazardous Materials, and Public Safety	Within 0.25 mile of the project, the approximate distance effects of releases of hazardous materials could occur. This distance is used in CEQA significance criteria (for example, will the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school).
Hydrology and Water Quality	San Leandro Creek, Sausal Creek, Indian Gulch/Pleasant Valley Creek, and Oakland Estuary watersheds.
Noise	Within 2,000 feet of the project. Noise attenuates rapidly with distance. The farther one is from the source, the lower the sound level will be.
Recreation	Within 0.5 mile of the project, which encompasses all parks and recreation facilities that intersect the project footprint and nearby parks and facilities.
Transportation	Western Contra Costa County and cities of Orinda, Piedmont, and Oakland, which encompasses most of the construction and operation traffic.
Tribal Cultural Resources	The API for the proposed project.
Wildfire	Contra Costa County, City of Orinda, Alameda County, City of Piedmont, and City of Oakland.

[a] For the resource topics Agriculture and Forestry Resources, Land Use, Minerals, Population/Housing, Public Services, and Utilities and Service Systems, either the project has no impacts, or the impacts are so minor they will not contribute to cumulative impacts. These resource areas are not discussed further in this chapter.

7.1.3 Cumulative Impact Analysis

The purpose of the project is to replace power line equipment on the approximately 5-mile length of four overhead 115 kV lines between Moraga and Oakland X substations that has reached the end of its useful life. This maintenance is needed for safe operation of the lines. The objectives of the project are to rebuild the power line path with new equipment; to ensure the lines are rebuilt with adequate line clearances between the ground or land use; and to construct a safe, economical, and technically feasible project that minimizes environmental and community impacts.

Implementation of APMs will further minimize less-than-significant short-term impacts related to aesthetics; agriculture and forestry resources; air quality; biological resources; cultural resources; energy; geology, soils, and paleontological resources; greenhouse gases; hazards, hazardous materials, and public safety; hydrology and water quality; noise; transportation; tribal cultural resources; and wildfire. As shown in Chapter 5, for agriculture and forestry resources, land use, minerals, population/housing, public services, and utilities and service systems, either the project has no impacts, or the impacts are so minor they will not contribute to cumulative impacts in the area. These resource topics are not discussed further in this chapter. In addition, for most of the resource areas, temporary impacts are localized and unlikely to be cumulative. The following sections provide a discussion regarding each relevant resource area.

7.1.3.1 Aesthetics

The proposed 115 kV power line rebuild will not substantially degrade the existing visual character or quality of the landscape setting. There are no specific recognized scenic vistas within the project viewshed. The perceived change from Interstate 580, the nearest designated state scenic highway approximately 600 feet west of the project, will be minor. Where the existing overhead lines will be replaced by underground lines, the removal of the existing towers, to the extent they are visible, will be a positive visual change.

In most cases, structures along the alignment are only partially visible and from any one location where the project can be seen, views are, in many cases, limited to a single pair of structures. Only a few locations afford open (public) views of multiple project structures. To the extent that the proposed project will be visible during construction along with one or more of the cumulative projects, adverse cumulative impacts may occur from the construction equipment, vehicles, materials, staging areas, and personnel. These construction impacts, however, will be temporary and will not create significant cumulative effects. In addition, PG&E will implement APM AES-1 to ensure aesthetics impacts during construction are reduced, including directing lighting sources away from residences.

Permanent visual change resulting from modifications to the existing PG&E alignment will be noticeable but largely incremental and will not substantially alter or degrade the existing visual character of the landscape within the project area. Intervening vegetation and built structures will fully or partially screen public views of the project to a large degree. For the most part, modifications to existing PG&E 115 kV lines will occur in a predominantly urban context, where established landscape features seen in public views include a variety of existing infrastructure, such as wood power poles, tubular steel poles, and lattice power line structures.

Glare along the rebuilt 115 kV power lines or within Moraga and Oakland X substations will be less than significant and further reduced with implementation of APM AES-2 requiring the use of non-specular conductors and a dulled galvanized finish on the new PG&E project poles, reducing potential glare of power line components. New project components adjacent to Oakland X Substation (riser poles and associated conduits and insulators) will be a nonreflective neutral gray color and galvanized steel structures will weather to a dull, nonreflective patina and will minimize the potential effect of glare. Potential impacts from glare will be less than significant.

The projects in Table 7.1-1 that are within 0.5 mile of the permanent project footprint are 2805 Park Boulevard Mixed-Use Building and Central Reservoir Replacement Project. The 6-story mixed-use building would be somewhat taller than the nearby 2- to 4-story residential buildings, but otherwise would be visually consistent with the urban character of the area. The Central Reservoir project would increase the reservoir height by 20 feet. As noted in the EIR for the Central Reservoir Replacement Project (EBMUD 2019), the tanks would remain as a water utility facility, and the perceived height and massing of the tanks above the existing reservoir would be consistent with the structures in the vicinity of the reservoir. In addition, the new tanks would blend within the surrounding vegetation and earthen berms planted with new vegetation. The project, with these projects in the vicinity, will not make a considerable contribution to the modification of the viewshed.

The remaining projects in Table 7.1-1 are a sufficient distance from the project (greater than 0.5 mile) that the less-than-significant impacts associated with project structures are not likely to contribute to a cumulative impact to aesthetics. Because of the linear nature of the power lines, only a small portion will be visible from any single viewing location in common with the other projects in the vicinity.

7.1.3.2 Air Quality

The air emissions from construction of the project will result in a temporary increase in criteria air pollutants; however, these emissions will not result in a cumulatively considerable net increase in emissions. Air quality emissions will occur within the SFBAAB under the jurisdiction of BAAQMD. The project, with other projects in the vicinity, will be managed by the BAAQMD for construction air quality emissions. The BAAQMD has provided project-level thresholds of significance for criteria pollutants for which the SFBAAB is in nonattainment, as well as for elevated localized concentrations of carbon monoxide. These are the levels at which the BAAQMD has determined that an individual project's contribution to the cumulative impact (nonattainment) is cumulatively considerable (BAAQMD 2023). If an individual project's contribution is below the project-level thresholds of significance, the project will have a less-than-significant impact.

Based on this criterion, project construction will not result in a cumulatively considerable net increase in the nonattainment pollutants (PM_{10}, $PM_{2.5}$, and the ozone precursors [nitrogen oxides and reactive organic gas]) because the emissions will be temporary; the average daily emissions are substantially less than the significance thresholds without implementation of APMs. Implementation of construction APMs, which follow BAAQMD's BMPs, will further reduce less-than-significant impacts. The project will not contribute to a significant cumulative impact to air quality.

7.1.3.3 Biological Resources

The project will have a less-than-significant impact to any candidate, sensitive, or special-status species populations. The incorporation of applicable measures from PG&E's BAHCP, ITP, and ITP FEIR, as well as project-specific APMs, further minimizes potential impacts. Most of the project's habitat impacts will be temporary and impacted areas will be restored to pre-existing conditions following project activities. The only permanent impacts will be associated with foundations for the replacement structures. Project operation and maintenance will be conducted with existing staffing using existing access and no impacts to special-status species will occur.

Little riparian habitat and other sensitive communities exist in the BSA. Within the project footprint, riparian habitat occurs primarily along access roads and near Moraga Substation. The project will not impact riparian habitat that it spans. Only minor trimming of riparian habitat will be necessary to provide construction equipment access. Trimming or removal of a small number of trees in Coast Live Oak Woodland to accommodate replacement structures RN26 and RS26 also will occur. With implementation of measures from the BAHCP, ITP, and ITP FEIR described previously, both direct and indirect effects will be further minimized. Project operation and maintenance will be conducted with existing staffing using existing access and no impacts to riparian habitat or other sensitive community will occur.

The project has been designed to avoid impacts on waterways and wetlands to the greatest extent feasible, and the project will not remove, fill, or result in the hydrologic interruption to waterways or wetlands. No direct impacts to aquatic resources are expected to occur. Implementation of the general measures from the BAHCP, ITP, and ITP FEIR will minimize indirect adverse impacts to wetlands. Project operation and maintenance will be conducted with existing staffing using existing access and no impacts to wetlands will occur.

Wildlife may move through the BSA and use breeding habitat during work activities. The eastern portion of the project footprint has been recognized as an important open space area and essential corridor/linkage by the California Department of Fish and Wildlife, the California Essential Habitat Connectivity, and the Critical Linkage Project. Construction may impede wildlife movement and degrade breeding habitat or nursery sites within and adjacent to work areas. Migratory birds may move through the BSA during work activities and may nest in the vicinity. Construction activities may temporarily degrade nesting habitat within the immediate vicinity of the work locations. Any potential effect is expected to be minimal based on the disturbed nature of many of the work locations and the large amount of surrounding habitat. These potential impacts will be further minimized through implementation of applicable measures from the BAHCP, ITP, ITP FEIR, and project-specific APMs.

The biological impacts of the project combined with other area projects will not be cumulatively considerable. The projects listed in Table 7.1-1 could have construction schedules that overlap with the proposed project; however, because most of these projects are in previously disturbed or developed areas, only minor impacts are expected to occur to associated biological resources. To minimize potential impacts on special-status species and other sensitive biological resources, the project will implement applicable measures from the BAHCP, ITP, ITP FEIR, and project-specific APMs. As a result, the project will not contribute to a cumulative impact.

7.1.3.4 Cultural Resources

No archaeological sites were identified in the API. The potential to encounter surface archaeological resources is estimated to be low. Four architectural resources were evaluated as eligible for listing in the California Register of Historical Resources and considered historical resources for the purposes of CEQA for this project. None will be significantly impacted by the proposed project. The project will result in a negligible visual change because the replacement structures are similar in size, type, and appearance to existing structures; or because the replacement structures will have a narrower profile than existing structures and, therefore, will be less obtrusive. The historic and current uses of these resources will remain intact, and the character-defining features associated with each resource will remain intact and not be diminished.

Project operation and maintenance of the overhead portion and substations will not change after construction of the project. Project operation and maintenance of the underground portion will not be ground disturbing typically and will occur within city streets or facilities. Should ground disturbing maintenance work be required, the underground portion is an area with low buried site sensitivity with past disturbances and, as such, will not cause a substantial adverse change in the significance of a historical or archaeological resource as defined in Section 15064.5; the project will have a less-than-significant impact during the operation and maintenance phase.

Project operation and maintenance of the overhead portion and substations will not change after construction of the project. Project operation and maintenance of the underground portion will not be ground disturbing typically and will occur within city streets or facilities. Should ground disturbing maintenance work be required, the underground portion is an area with low buried site sensitivity with past disturbances and, as such, will not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5; there will be less-than-significant impacts during the operation and maintenance phase

The cultural resource impacts of the project combined with other area projects will not be cumulatively considerable. The projects listed in Table 7.1-1 are located outside the proposed project API. In addition, these projects would be expected to perform their own cultural resource surveys and to implement appropriate avoidance and minimization measures, resulting in only minimal impacts to cultural resources. To minimize the potential impacts of the project on cultural resources, the project will implement APM CUL-1 through APM CUL-3. As a result, the project will not contribute to a cumulative impact.

7.1.3.5 Energy

The proposed project will not result in wasteful, inefficient, or unnecessary use of energy. Construction of the project will consume a minimal amount of fuel, less than approximately 0.0003 percent of the statewide gasoline consumption, approximately 0.013 percent of the statewide diesel consumption, and approximately 0.001 percent of statewide jet fuel consumption. PG&E's engineering and construction staff also have developed an efficient construction plan and sequence that minimizes vehicle trips and avoids wasteful, inefficient, or unnecessary consumption of energy. Implementation of APM GHG-1, which minimizes unnecessary construction vehicle idling time, will further reduce construction energy consumption. No increase in operation and maintenance fuel consumption as compared to current levels is expected.

Additionally, construction of the project will support state and local plans for strengthening the electricity delivery system, particularly in areas susceptible to extreme heat and with high wildfire potential and increasing renewable energy. It will continue to deliver renewable generation within PG&E's power mix. The project will not add capacity for the specific purpose of serving a nonrenewable energy resource. However, the project infrastructure will continue to be available for interconnection from both renewable and nonrenewable energy sources.

In consideration of cumulative energy use, the proposed project will not contribute to a substantial demand on energy resources or services such that new regional energy facilities will be required to be constructed as a result of the incremental increase in energy demand resulting from the proposed project. Therefore, the proposed project will have a less-than-cumulatively-considerable impact with respect to the wasteful or inefficient use of energy. As such, the proposed project will not result in a cumulatively considerable contribution to a potential cumulative impact.

7.1.3.6 Geology, Soils, and Paleontological Resources

As discussed in Section 5.7, it is likely that the project will be exposed to at least one moderate or greater earthquake located close enough to produce strong ground shaking in the project area. The greatest potential for strong seismic ground shaking within the project area comes from the Hayward Fault, which has produced moderate to large earthquakes during historical time. Power line structures have not been sited above active traces of the fault. In addition, overhead power line spans will be designed to accommodate potential fault displacement between support structures. The project will incorporate APM GEO-1 to develop seismic design criteria and appropriate safety design measures.

The project generally is not within a known area of liquefaction hazard; however, localized areas of rated liquefaction potential occur within the project area. Although there is a low probability that conditions conducive to liquefaction will be encountered within the project alignment, the project will implement APM GEO-2, which will minimize liquefaction and associated ground failure hazards such as lateral spreading that could be exacerbated by strong seismic ground shaking.

The project is located within a known landslide hazard area. No proposed project facilities, including overhead structures in the overhead portion of the alignment and power lines in the underground portion of the alignment, are located within a mapped landslide area. However, the proposed locations of two structures are above mapped landslides. The proposed deep foundations, including micropiles and caissons, will minimize the potential for impacts from shallow slope failure. Furthermore, the project will incorporate APM GEO-3 to include appropriate design measures for localized soil conditions.

Project impacts associated with erosion and loss of topsoil during construction will be minimized because of the limited areas that will be graded and disturbed, the temporary nature of construction, and the use of standard BMPs and dust control measures to minimize fugitive dust emissions and stormwater runoff. The project also will incorporate APM HYD-1, which requires development and implementation of a stormwater pollution prevention plan.

Expansive soils were identified in the Contra Costa County portion of the project area. Replacement foundations in the overhead portion of the alignment will be either a group of micropiles with a pile cap or a single drilled-shaft reinforced-concrete caisson. In the underground portion of the alignment, a duct bank will be encased in 1.5-foot-thick thermal concrete located a minimum of 3 feet below the road surface. Neither the deep foundations to be used for the aboveground portion of the project nor the duct banks in the underground portion of the project are susceptible to damage from expansion and contraction of shallow soils.

Cumulative projects in Table 7.1-1 would be expected to perform geotechnical investigations and employ appropriate engineering and construction measures. Impacts from those projects generally would be site specific. The cumulative projects do not overlap with the proposed project footprint and would not affect potential project impacts associated with geology or soils. Consequently, the potential combined impacts of the proposed project and other identified projects would not result in a cumulatively considerable impact. The impacts of the proposed project are not individually significant and will not contribute significantly to any potential hazard when considered individually as well as with other related projects that have been identified for development in the area.

Excavation activities deeper than 3 feet in four geological units in the project study area have high paleontological sensitivity and have high potential to encounter paleontological resources. For these construction activities, PG&E will implement paleontology APM PAL-1, which requires a qualified project paleontologist; APM PAL-2, which requires worker awareness training monitoring for all project excavation activities deeper than 3 feet below ground surface; APM PAL-3, which requires monitoring for select construction activities; and APM-4, which requires recovery of paleontological resources.

Cumulative projects in Table 7.1-1 in the vicinity of the PG&E project with excavation activities presumably would implement similar measures if resources are encountered. No substantial contribution to any potential cumulative effects on unknown paleontological resources will occur from development of the other related projects.

7.1.3.7 Greenhouse Gas Emissions

GHG emissions from global climate change is a cumulative impact; a project participates in this potential impact through its contribution combined with the cumulative increase of all other sources of GHG emissions. Amortized over 30 years, the estimated project GHG construction emissions are approximately 117 metric tons (MT) of carbon dioxide equivalent (CO_2e) per year. Implementation of APM GHG-1 will further reduce GHG emissions. The total operational GHG emissions will be approximately 14 MT CO_2e per year and will be minimized through implementation of APM GHG-2. The combined total GHG emissions (operations and amortized construction) will be approximately 131 MT CO_2e per year, which is lower than the South Coast Air Quality Management District's significance threshold of 10,000 MT CO_2e per year.

The project demonstrates compliance with BAAQMD's GHG-related land use thresholds of significance by being consistent with a local GHG reduction strategy. Specifically, through undergrounding a portion of overhead power lines, the project will support local efforts to reduce the risk of extreme heat and wildfire risk to the electricity distribution system and secure delivery of renewable energy through PG&E's existing power mix.

The minimal short-term construction GHG emissions will not interfere with the long-term goal of Senate Bill 32 to reduce GHG emissions to 40 percent below 1990 levels by 2030. As a result, the proposed project will not contribute significantly to the emissions associated with the construction of other projects planned in the area that could be underway at the same time, and thus the impact will not be cumulatively considerable.

7.1.3.8 Hazards, Hazardous Materials, and Public Safety

All potential construction impacts related to hazards, hazardous materials, and accidents involving hazardous materials are considered less than significant with implementation of APM HAZ-2 and APM HAZ-4. During construction activities, there is an increased potential for accidental release of hazardous materials from operation of vehicles or motorized pieces of equipment. Because hazardous materials will be transported, used, and disposed of in accordance with appropriate procedures, the project will not create a significant hazard to the public or environment.

To reduce shock hazards and avoid electrocution of workers or the public, PG&E will comply with the provisions found in the CalOSHA Title 8 of the CCR, particularly the electrical health and safety regulations found in Chapter 4, Subchapter 5 in the Electrical Safety Orders, Sections 2700–2989, which are relevant to high-voltage work. PG&E also will implement APM HAZ-3, Shock Hazard Safety Measures. During construction, PG&E also will implement APM WFR-1 and APM WFR-2, requiring workers to be trained in fire prevention practices and carry emergency fire suppression equipment to reduce the wildland fire risk in the project area.

There is potential for unknown contaminated soils to be encountered during construction. If contaminated soils are encountered in these areas during construction, APM HAZ-5 will be implemented. In accordance with APM HAZ-5, potentially contaminated soil that has not been precharacterized will be stockpiled separately to be tested, managed, and transported for disposal as appropriate.

The proposed project will not conflict with an adopted emergency response plan or evacuation plan. Temporary road and lane closures (including rolling stops) are anticipated when certain sections of the PG&E lines are being removed or reconductored at the road overhead crossings. Guard structures will be installed on the sides of roadways and potentially in other public areas to provide protection in the event of a dropped cable. Where temporary partial or complete road closures occur, PG&E will implement APM TRA-1, Temporary Traffic Controls, to minimize effects on traffic and transportation, including emergency vehicle access and evacuation routes. Construction impacts to emergency access and evacuation will be less than significant.

No changes in operation and maintenance activities are anticipated with implementation of the project. Therefore, no impacts associated with operation and maintenance will occur.

Cumulative projects listed in Table 7.1-1 also have the potential to disturb potentially contaminated soils or result in accidental releases of hazardous materials. These projects would be expected to characterize soils and sediments and follow applicable regulations for characterization, handling, and disposing of soils or work within areas of potentially contaminated sediments. Except for the remaining undeveloped parcels in the Wilder subdivision and the Sibley Volcanic Regional Preserve Group Campground, the cumulative projects in Table 7.1-1 are farther than 0.25 mile from the proposed project, the approximate distance in which effects of releases of hazardous materials could occur.

The impacts of the proposed project related to hazards or hazardous materials are not individually significant with implementation of APM HAZ-1 through APM HAZ-5. Furthermore, cumulative effects of this and other related excavation projects will not be significant, because each project must similarly follow the applicable federal and state rules and regulations required to ensure that no substantial impacts occur.

7.1.3.9 Hydrology and Water Quality

Project construction has the potential to affect water quality temporarily through activities such as scraping, grading, and excavation, but impacts will be less than significant. Project structures, temporary work areas, and construction access have been sited to avoid surface water, including waterways and wetlands. The project will have no direct impact on riparian habitats or wetlands. Implementation of APM HYD-1 through APM HYD-3 will further reduce less-than-significant impacts to hydrology and water quality.

No changes in operation and maintenance activities are anticipated with implementation of the project. Therefore, there will be no impacts associated with operation and maintenance.

The cumulative projects listed in Table 7.1-1 that could affect water quality would be those construction projects in areas draining to the same basins. These projects would be subject to the same federal, state, and local regulations regarding drainage plans and flooding potential as the proposed project and typically would be required to draft and implement a stormwater pollution prevention plan with specific provisions that address erosion and sedimentation control during construction and operation. These impacts would be localized and controlled at the source and would not be considerable in relation to other cumulative projects; therefore, the proposed project will not contribute substantially to any potential cumulative impacts on hydrology and water quality.

7.1.3.10 Noise

Because construction activities will be conducted near residences, a temporary increase in noise will result. Although noise levels from construction activities at times may exceed noise limits established by local jurisdictions, construction of most project components at any given location will occur for a short period of time and will move between different points of the lines. Further, PG&E is exempt from local noise standards. Given the limited and intermittent duration of construction activity at any one location, impacts under this criterion will be less than significant with the implementation of APM NOI-1 through APM NOI-7. Construction within each work area is anticipated to be short term, lasting between a few days to 2 to 3 weeks with intermittent and nonconsecutive days, further minimizing the total duration of elevated noise experienced by any one sensitive receptor.

Pile driving will be limited in duration and only be used for construction of the underground portion of the project if sheet piles are needed to stabilize vault excavations. These construction areas are expected to be far enough from buildings to not exceed vibration damage criteria. Nevertheless, APM NOI-8 will be implemented to require a vibration assessment that will consider site-specific factors and be incorporated into project construction. Impacts will be temporary and less than significant.

The cumulative projects listed in Table 7.1-1 may have overlapping construction periods but would be subject to the same noise ordinances and vibration criteria and all but two are more than 2,000 feet from the proposed project. One cumulative project within 2,000 feet is the Wilder Development that, while almost built out, has a few undeveloped parcels. One of the six potential helicopter landing zones is approximately 400 feet from the nearest parcel available for development. Landing zone use will occur over a short timeframe (approximately 22 to 23 nonconsecutive days). Should the parcel be developed while the proposed project uses the potential landing zone, the overlap of construction activity will be intermittent and short term.

The other cumulative project within 2,000 feet is the Sibley Volcanic Regional Preserve Group Campground. The proposed campground site is not near sensitive users. Should the campground be constructed before the proposed project and the proposed project uses the site during construction, the campground will be temporarily closed during project construction. Construction of the project will result in a less-than-significant impact and will not contribute substantially to any potential cumulative noise or vibration impacts.

The updates to the 115 kV power lines are not predicted to cause any noise sensitive receptor to exceed 45 A-weighted decibels during foul weather conditions. Proposed changes to Moraga Substation and to Oakland X Substation do not add transformer banks or any other new noise-producing equipment at the substations. Maintenance activities for the rebuilt power lines generally are expected to be the same as existing maintenance activities and typically will occur over short timeframes and generate minimal noise. As noted previously, all but two of the cumulative projects in Table 7.1-1 are more than 2,000 feet from the proposed project. In the unlikely event the construction of the Wilder housing development occurs while the nearest helicopter landing zone is in use, the overlap of construction activity will be intermittent and short term. The Sibley Volcanic Regional Preserve Group Campground, if completed prior to the proposed project, will be temporarily closed if and when the site is used for proposed project construction. The proposed project will not contribute to a cumulative noise or vibration impact during operation and maintenance.

7.1.3.11 Recreation

The project will not result in a substantial increased demand for recreational facilities or adversely affect the existing recreational resources in a permanent manner. The project will not include recreational facilities or require the construction or expansion of recreational facilities. Although construction activities will temporarily reduce or prevent access to several parks and recreation facilities, construction activities are short term and will last no more than a few weeks at a specific park location. Multiple parks and recreation facilities are available nearby in Orinda, Contra Costa County, Oakland, and Piedmont that can be used for these short periods. PG&E will coordinate any closures with park operators to minimize impacts to users per APM REC-1. Construction activities will not affect access to the parks and recreation facilities following construction. Operation and maintenance activities in the park and open space areas will be the same as current activities and no change in access to recreation during operations will occur. Impacts to parks and recreation facilities will be less than significant.

The cumulative projects listed in Table 7.1-1 could have construction schedules that overlap with the proposed project. However, other than EBRPD's Sibley Volcanic Regional Preserve Group Campground construction, none have construction areas affecting the same parks and recreation facilities as the proposed project. Construction workers for these projects would be expected to come from the local workforce and would not increase use of parks and recreation facilities. The campground area is one of six potential landing zones for helicopter use identified for the proposed project. Construction of the campground site and restroom facilities may be completed before construction of the proposed project begins. In that case, if the landing zone is used by the project, the campground closure will occur over short timeframes and EBRPD has other campground facilities for campers to use in the region, including at the nearby Redwood Regional Park. Any damages to the campground resulting from the proposed project will be repaired. Any cumulative projects that would have operations that increase the use of existing parks or recreational facilities such that substantial physical deterioration of the facility would require repairs to mitigate these impacts. The recreation impacts of the project combined with other area projects will not be cumulatively considerable.

7.1.3.12 Transportation

The project will not conflict or be inconsistent with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Project construction traffic will temporarily increase traffic volumes on local roadways, arterials, and state highways, and most trips will occur when background traffic volumes are somewhat lower. The effects of these volume increases will be short term and periodic. Not all trips will affect the same roads, as crew members along with the necessary equipment will be working at multiple locations. When construction is completed, construction-related traffic will cease, and vehicle miles traveled will return to pre-existing conditions. The project will not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b).

Temporary road and lane closures are anticipated when certain sections of the PG&E lines are being removed or reconductored at the road overhead crossings and where lines will be installed underground. In some locations, road closures may last up to 2 weeks. Full closures at several locations along Montclair Railroad Trail also will likely last up to 2 weeks. Temporary interference with walking or bicycling accessibility may occur from temporary closures of sidewalks and trails along roadways. Any closures will be temporary and short term, and closures will be coordinated with Caltrans or local jurisdictions to reduce the impacts to potential temporary and short-term emergency access. PG&E will provide, as part of the Traffic Management Plan, notification to property owners and businesses in advance of work. In addition, where the installation of guard structures is required, APM TRA-1, which requires that traffic controls and other traffic safety measures be in place to maintain proper traffic flow, will further reduce any impacts. Implementation of APM TRA-2 will restore all removed or damaged curbs, gutters, sidewalks, and paved surfaces, as necessary.

Cumulative projects listed in Table 7.1-1 that may be under construction at the same time have the potential for a cumulative impact on traffic and transportation in the area; however, with proper coordination and development of traffic control plans with permitting entities, no significant cumulative construction impacts to traffic or transportation are expected to occur.

7.1.3.13 Tribal Cultural Resources

The project's potential cumulative effects on tribal cultural resources will be evaluated by the California Public Utilities Commission during the Assembly Bill 52 process.

7.1.3.14 Wildfire

Portions of the project are in areas identified as very high fire hazard safety zones, including some in State Responsibility Areas. Construction activities, including work areas, staging areas, and laydown areas, and temporary access associated with rebuilding the power lines could cause a temporary increase in fire risks from overland travel, the use of equipment that may create sparks, and construction equipment and vehicles that contain combustible materials such as fuels and oils and ignition sources. However, PG&E will comply with all applicable California Health and Safety Codes and ordinances regulating the handling, storage, and transportation of hazardous materials, which will help to minimize the potential for accidental conditions, including fire. Additionally, during construction, PG&E will implement APM WFR-1, Construction Fire Prevention Plan, and APM WFR-2, Fire Prevention Practices, that include requirements for workers to be trained in fire prevention practices; workers to carry emergency fire suppression equipment to reduce the wildland fire risk in the project area; that vehicles not be parked on dry vegetation; and that a minimum 10-foot area be cleared of all flammable material for any stationary ground-level activities that have the potential to create a spark, fire, or flame. Construction vehicles and equipment are anticipated to access project construction areas by using existing PG&E access and paved roads, existing dirt access roads, or overland access. Construction vehicles and equipment needed at the pull sites will follow designated access routes and are expected to be parked or staged within the project right-of-way or alongside existing access roads. Two 4,000-gallon water trucks will be used during construction activities in unincorporated Contra Costa County, where fire hydrants and related fire suppression infrastructure are not present. Road closures will be coordinated with Caltrans or local jurisdictions to reduce the effects to potential temporary and short-term emergency access.

Completion of the project will replace aging structures with stronger, more fire-resistant structures and conductors. The results of the Wildfire Transmission Risk Model estimate a 90 percent reduction in wildfire risk from the project. The project will not have occupants and, therefore, will not potentially expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire caused by slope, prevailing winds, or other factors.

Although other projects in the vicinity have the potential to increase potential wildfire risks, they must comply with all relevant wildfire policies. Cumulative effects of this and other related projects will not be significant, and no cumulative impacts will occur.

7.2 Growth-Inducing Impacts

7.2.1 Growth-Inducing Impacts

The following criteria, derived from CEQA Guidelines Section 15126.2(d), are used to evaluate whether the project will result in potential individual or cumulative growth-inducing impacts:

- Any economic or population growth in the surrounding environment that will directly or indirectly result from the proposed project
- Any increase in population that could further tax existing community service facilities (schools, hospitals, fire, police), which will directly or indirectly result from the proposed project

- Any obstacles to population growth that the proposed project would remove
- Any other activities, directly or indirectly encouraged or facilitated by the proposed project, that would cause population growth that could significantly affect the environment, either individually or cumulatively

The project will not, either directly or indirectly, foster economic or population growth. The proposed project is a maintenance project and replaces aging infrastructure. It is not intended to supply power related to potential growth for a particular development and will not lead to growth in areas not previously approved for growth by local agencies. Improved system reliability will not generate new development and the project does not propose new housing, businesses, or other land use changes that will induce economic or population growth in the area. Therefore, no project-related or cumulative growth-inducing impacts are expected.

Project operation will not provide new employment. Construction workers will consist primarily of either existing PG&E or contracted workers in the local area or workers who commute from the neighboring cities. Because the construction duration will be relatively short (approximately 35 months, with gaps when no construction will occur, and up to approximately 15 months of vegetation restoration), it is not expected that the construction workers from outside the area will permanently relocate to the project area. Operation and maintenance of the rebuilt lines will be performed by existing staffing and will not change from the existing procedures. Because construction will be temporary and operation and maintenance will not create new jobs, any changes to economic and population growth will be less than significant.

The project will not place a higher demand on existing community services. Water needed during project construction will be obtained from existing resources; water use for project operations will be similar to current use. Wastewater will not result from project operation. As discussed in Section 5.14, Population and Housing, and Section 5.15, Public Services, existing community services are sufficient to serve the project for both the short and long term, and no new housing will be required for construction. Operation and maintenance will be provided by existing staffing.

The project will not remove any obstacles to growth in the area. The project will not extend power distribution or other infrastructure into areas not already served. A primary purpose of the proposed project is to address aging infrastructure and reliability of the system. The objectives of the project are to rebuild the power line path with new equipment; to ensure the lines are rebuilt with adequate line clearances between the ground or land use; and to construct a safe, economical, and technically feasible project that minimizes environmental and community impacts.

8. List of Preparers

8.1 List of Preparers

Many PG&E employees and representatives contributed to the preparation of, or reviewed and commented on drafts of, this Proponent's Environmental Assessment. In addition, the consultants listed in the following table provided support to PG&E in preparing this document.

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None.

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9.5.21 Section 5.21. Mandatory Findings of Significance

None.

9.6 Chapter 6. Comparison of Alternatives

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9.7 Chapter 7. Cumulative Impacts and Other CEQA Considerations

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9.8 Chapter 8. List of Preparers

None.