DOCKETED	
Docket Number:	25-OPT-01
Project Title:	Viracocha Hill Battery Energy Storage System Project
TN #:	264232
Document Title:	Volume 1 Viracocha Hill BESS AB-205 Opt-In Application-Submittal #2 Package
Description:	Volume 1 Viracocha Hill BESS AB-205 Opt-In Application-Submittal #2 Package 25-OPT-01
Filer:	Sarah Madams
Organization:	Jacobs
Submitter Role:	Applicant Consultant
Submission Date:	6/13/2025 1:59:43 PM
Docketed Date:	6/13/2025

Reclaimed Wind LLC
600 W Broadway – Suite 700
San Diego, CA 92101

June 09, 2025

Mr. Drew Bohan
Executive Director
California Energy Commission
715 P Street
Sacramento, CA 9814

RE: AB205 Opt-In Application for the Viracocha Hill BESS - Part 2

Dear Mr. Bohan:

Reclaimed Wind LLC (Applicant) submits Part 2 of the Opt-In Application (Application) for the Viracocha Hill Battery Energy Storage System (Viracocha Hill BESS), 25-OPT-01. Part 1 of the Application was docketed on February 14, 2025 (TNs# 261765, 261767-261775, 261777, 261779, and 261781).

Part 2 of the Application includes the final remaining sections:

- Section 4 – Mandatory Opt-In
- Section 5.1 - Air Quality
- Section 5.2 - Biological Resources
- Section 5.7 – Noise and Vibration
- Section 5.9 - Public Health
- Section 5.10 – Socioeconomics
- Section 5.13 – Visual Resources
- Confidential Appendices

In addition, an updated Section 2 – Project Description and Section 5.14 Waste Management are also provided and incorporate minor changes to ensure consistency between all sections. The changes are provided in ~~strikeout~~/**bold**. These edits are applicable to all sections provided in the Part 1 submittal.

Pursuant to 20 Cal. Code Regs. Sections 1707 and 1876, I, Antonio Arturo Sieira Mucientes, an officer of Reclaimed Wind LLC hereby attest under penalty of perjury under the laws of the State of California that the information set forth in the enclosed Opt-in Application for the Viracocha Hill BESS Project is true and accurate to the best of my knowledge and belief.

We look forward to working with the Commission regarding the Opt-In Application for certification of the Viracocha Hill Battery Energy Storage Project.

Sincerely,

SIEIRA MUCIENTES ANTONIO ARTURO - 50826695F

Firmado digitalmente por SIEIRA MUCIENTES ANTONIO ARTURO - 50826695F
Fecha: 2025.06.09 09:40:20 +02'00'

Antonio Arturo Sieira Mucientes
CEO

Reclaimed Wind LLC
600 W Broadway – Suite 700
San Diego, CA 92101

June 09, 2025

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Antonio Arturo Sieira Mucientes
CEO

Volume 1

Viracocha Hill Battery Energy Storage System AB-205 Opt-In Application - Submittal Package #2

Submitted by:

Reclaimed Wind LLC

June 2025

Technical Assistance by:

Jacobs

Revision: 0

Contents

Tables

Figures

Acronyms and Abbreviations

µg/m^3	microgram(s) per cubic meter
3D	three-dimensional
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACCDA	Alameda County Community Development Agency
ACDEH	Alameda County Department of Environmental Health
ACE	Areas of Conservation Emphasis
ACE	Altamont Corridor Express
ACFC	Alameda County Fire Code
ACFD	Alameda County Fire Department
ACGP	Alameda County General Plan
ACS	American Community Survey
ACSO	Alameda County Sheriff's Office
ACSR	Aluminum Conductor Steel Reinforced
ADT	average daily traffic
AERMAP	AERMOD terrain processor
AERMET	AERMOD meteorological data processor
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AFCD	Alameda County Fire Department
AHJ	authority having jurisdiction
ALS	Advanced Life Support
AMSL	above mean sea level
APLIC	Avian Power Line Interaction Committee
APN	Assessor's Parcel Number
Applicant	Reclaimed Wind, LLC
APWRA	Altamont Pass Wind Resource Area
ARDR	Aquatic Resources Delineation Report
ARMR	Archeological Resource Management Report
ASA	Alternative Substation Area

AST	aboveground storage tank
ATC	Authority to Construct
ATCM	Airborne Toxic Control Measures
AVE	area of visual effect
AWWI	American Wind Wildlife Institute
BAAQMD	Bay Area Air Quality Management District
BACT	best available control technology
BCE	before common era
BESS	battery energy storage system
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
BOL	Beginning of Life
BOS	Board of Supervisors
BRMIMP	Biological Resources Mitigation Implementation and Monitoring plan
BSA	Biological Study Area
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAES	Compressed Air Energy Storage
CAFE	Corporate Average Fuel Economy
CAISO	California Independent System Operator
Cal/OSHA	California Division of Occupational Safety and Health
CalARP	California Accidental Release Prevention
CalEnviroScreen	California Communities Environmental Health Screening Tool
CalEPA	California Environmental Protection Agency
CalGEM	California Geologic Energy Management
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAPP	Community Air Protection Program
CARB	California Air Resources Board
CBC	California Building Code

CBO	Chief Building Officer
CBP	Community Benefits Plan
CBSC	California Building Standards Commission
CCAP	Community Climate Action Plan
CCR	California Code of Regulations
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CDE	California Department of Education
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEHCP	California Essential Habitat Connectivity Project
CEMS	continuous emissions monitoring systems
CEQA	California Environmental Quality Act
CERS	California Environmental Reporting System
CESA	California Endangered Species Act
CFC	California Fire Code
CFR	Code of Federal Regulations
CGC	California Government Code
CGS	California Geological Survey
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CHSC	California Health and Safety Code
CIWMA	California Integrated Waste Management Act
CMIM	computerized maintenance/inventory management
CMP	Congestion Management Program
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
COC	Conditions of Certification
CPAD	California Protected Areas Database
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CRS	Community Rating System
CRS	Cultural Resources Specialist
CRTR	Cultural Resources Technical Report
CTC	Alameda County Transportation Commission
CTG	Controlled Techniques Guidance
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CWC	California Water Code
CWHR	California Wildlife Habitat Relationships
dB	decibel
dBA	decibel (A-weighted scale)
DCS	Distributed Control System
DESCP	drainage, erosion, and sediment control plan
DOC	Department of Conservation
DOF	California Department of Finance
DOT	U.S. Department of Transportation
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
DPS	distinct population segment
DTSC	California Department of Toxic Substances Control

DWR	California Department of Water Resources
EACCS	East Alameda County Conservation Strategy
EBRPD	East Bay Regional Park District
EBRPD	East Bay Regional Park District
ECAP	East County Area Plan
ECCCHC	East Contra Costa County Habitat Conservancy
EDD	California Employment Development Department
EFZ	Earthquake Fault Zone
EIR	environmental impact report
EJ	environmental justice
EMF	electromagnetic fields
EMT	emergency medical technician
EO	Executive Order
EOL	End of Life
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ERP	Emergency Response Plan
ESA	federal Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FGC	Fish and Game Code
FHSZ	fire hazard severity zone
FMMP	Farmland Mapping and Monitoring Program
FP	Fully Protected
FRA	Federal Responsibility Areas
FRAP	Fire and Resource Assessment Program
FY	fiscal year
GHG	greenhouse gas
GLO	General Land Office
GO	General Order

GWP	global warming potential
HAP	hazardous air pollutant
HARP	Hotspots Analysis and Reporting Program
HAZMAT	Hazardous Materials
HFC	hydrofluorocarbons
HFTD	High Fire Threat District
HI	hazard index
HMBP	Hazardous Materials Business Plan
HMDB	Historic Marker Data Base
hp	horsepower
HRA	health risk assessment
HSP	Health and Safety Plan
HV	high voltage
HVAC	heating, ventilation, and air conditioning
HWCL	Hazardous Waste Control Law
IBMI	Ione Band of Miwok Indians
IFC	International Fire Code
IOU	investor-owned utilities
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
ISO	Insurance Services Office
ITP	Incidental Take Permit
IUCN	International Union for Conservation of Nature
KOP	key observation point
kV	kilovolt
kW	kilowatt(s)
LARPD	Livermore Area Recreation and Park District
LAVTA	Livermore Amador Valley Transit Authority
lb/year	pound(s) per year
L_{eq}	equivalent sound pressure level
LHMP	Local Hazard Mitigation Plan

L_n	sound pressure level exceeded during n percent of the measurement period, where n is a number between 0 and 100
LORS	laws, ordinances, regulations, and standards
LOS	level of service
LPA	Large Parcel Agriculture
LRA	Local Responsibility Area
m	meter(s)
MACT	maximum available control technology
MBTA	Migratory Bird Treaty Act
MD	Oakland-Hayward-Berkeley Metropolitan District
MEIR	maximally exposed individual resident
MEIW	maximally exposed individual worker
MMA	Material Modification Assessment
Mountain House ESD	Mountain House Elementary School District
MPO	metropolitan planning organization
MRR	Modification Request Report
MRZ	mineral resource zone
MTC	Metropolitan Transportation Commission
MV	medium voltage
MW	megawatt(s)
MW-hr	megawatt hour(s)
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEC	National Electric Code
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NESHAP	National Emission Standards for Hazardous Air Pollutants
NETR	Nationwide Environmental Title Research
NFPA	National Fire Prevention Association
NHD	National Hydrography Dataset
NHMLA	Natural History Museum of Los Angeles

NHPA	National Historical Preservation Act
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen oxide
NO_X	nitrogen oxides
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
NWI	National Wetlands Inventory
NWIC	Northwest Information Center
NWS	National Weather Service
O&M	operations and maintenance
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PCE	passenger car equivalents
PCO	Point of Change of Ownership
PeMS	Performance Measurement System
PFC	perfluorocarbons
PG&E	Pacific Gas and Electric
PM_{10}	particulate matter with aerodynamic diameter equal to or less than 10 micrometers
PM_{10}	particulate matter with a diameter of 10 micrometers or less
$PM_{2.5}$	particulate matter with a diameter of 2.5 micrometers or less
$PM_{2.5}$	particulate matter with aerodynamic diameter equal to or less than 2.5 micrometers
PMI	point of maximum impact
POI	Point of Interconnection
PPE	Personal Protective Equipment

PRC	Public Resources Code
PRIME	plume rise model enhancement
PRM	Paleontological Resources Monitor
PRMMP	Paleontological Resources Monitoring and Mitigation Plan
Project	Viracocha Hill Battery Energy Storage System Project
PRR	Paleontological Resources Report
PRS	Paleontological Resource Specialist
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
PTO	permit to operate
PUC	Public Utilities Code
RAWS	Remote Automated Weather Station
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
REL	Reference Exposure Level
ROW	right-of-way
ROWD	Report of Waste Discharge
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
S&HC	California Streets and Highways Code
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Officer
SHTAC	Swainson's Hawk Technical Advisory Committee
SIL	significant impact level
SJCOG	San Joaquin Council of Governments
SJGH	San Joaquin General Hospital
SJMSCP	San Joaquin County Multispecies Habitat Conservation and Open Space Plan
SMARA	Surface Mining and Reclamation Act
SO	Secretary Order
SO_2	sulfur dioxide

SO_X	sulfur oxides
SPCC Plan	Spill Prevention Control and Countermeasures Plan
SRA	State Responsibility Area
SSC	Species of Special Concern
SSJCFA	South San Joaquin County Fire Authority
State Parks	California Department of Parks and Recreation
SVP	Society of Vertebrate Paleontology
SWIS	Solid Waste Information System
SWMP	Stormwater Management Plan
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCP	Traditional Cultural Property
TDS	total dissolved solids
TMDL	total maximum daily loads
TMP	Transportation Management Plan
Tracy Joint USD	Tracy Joint Unified School District
TSDF	Treatment, Storage, and Disposal Facility
UCMP	University of California, Berkeley, Museum of Paleontology
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VIA	visual impact assessment
VMT	vehicle mile traveled
VOC	volatile organic compounds
WDR	Waste Discharge Requirements
WEAP	Worker Environmental Awareness Program
WL	Watch List
WRCC	Western Regional Climate Center

yd^3	cubic yard(s)
ZEV	Zero Emissions Vehicle

1. Executive Summary

Section 1 Executive Summary was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

2. Project Description

Section 2 Project Description was originally docketed February 14, 2025, TN# 261781. A revised version of this section is being re-submitted as it has been updated to incorporate minor changes which ensures consistency between all sections.

2. Project Description

Reclaimed Wind LLC (the Applicant) proposes to construct, own, operate and eventually repower or decommission the 90.7 MW (at the Point of Interconnection, POI) Viracocha Hill Battery Energy Storage System Project (Viracocha Hill BESS or Project) in Alameda County, California, adjacent to the proposed Sand Hill Wind Repower Project (to be constructed, owned, and operated by an affiliate of the Applicant) as shown on Figure 1-1. The Project includes a fenced BESS yard which will include a 362.8 megawatt-hour (MWh) BESS facility, improvements to an existing access road, Project substation and a new proposed gen-tie line. If expanding the existing Ralph Substation is not feasible, a new switching station or a line-tap located adjacent to the Ralph Substation would be included as part of the project.

2.1 Project Objectives

The primary purpose of the Project is to assist the State of California (State) in meeting the goal of all electricity in California to come from renewable and zero carbon resources by 2045 as required under Senate Bill 100 (2018). To achieve this goal, new power supplies and power storage are needed. The Project would help balance electricity generation from all sources, including, but not limited to, wind and solar, with electricity demand by storing excess generation from all power sources and delivering back to the grid when demand exceeds real-time generation supply. The Project displaces the need for additional fossil fuel-based generating stations to serve peak demand periods when renewable sources may be inadequate or unavailable. The Project objectives are as follows:

1. Construct and operate an up to approximately 362.8-MW-hr and 90.7 MW BESS facility at the POI to support the state's ~~renewable~~ energy goals.
2. Develop a BESS facility that minimizes significant environmental impacts of project development through the use of existing infrastructure, existing real property interests and rights-of-way, project design measures, and feasible mitigation measures.
3. Develop a BESS facility in close proximity to a utility grid-connected substation with existing capacity available for interconnection.
4. Develop an eligible energy storage facility that can assist community choice aggregators, investor-owned utilities, and publicly owned utilities in meeting their California Renewables Portfolio Standard (RPS) requirements.
5. Develop a Community Benefits Plan (CBP) that ensures the proposed project benefits the local community and contributes to a clean and equitable economy for construction materials.
6. Create new, high-paying construction jobs and skilled trades and professional roles in Alameda County, California.

2.2 Facility Description and Location

The Project will be located on a 443-acre parcel (APN 99B-7300-1-5) and will consist of a 17-acre area that will include an approximately 14-acre BESS yard, laydown area, substation, and retention pond. The exact design and location of these features will be refined as the Project moves forward. Additionally, the Project includes improvements to a 0.3-mile-long access road, a 0.15-acre road improvement and an approximately 1,325-foot-long gen-tie line connecting to the Ralph Substation. If expanding the Ralph Substation is unavailable, a new switching station or a line-tap will be developed adjacent to the existing substation.

The Project anticipates providing storage of energy for California's electric markets, supporting the state's pursuit of an environmentally clean and reliable electrical system.

The location and the configuration of the Project have been selected to reduce curtailment for solar and wind projects during the period from 9 am to 5 pm, locally and at the system level. A Modification Request Report (provided as Appendix 3A under a request for confidentiality) concluded that Pacific Gas and Electric (PG&E) network (transmission) upgrades are required to receive the stored energy from the Ralph Substation. Viracocha Hill BESS PG&E's network upgrades will support sustainable operation of PG&E's system and further projects not affiliated with the Project. PG&E will construct and complete the network updates prior to Project operation.

2.2.1 Facility Description

2.2.1.1 Site Access

The Viracocha Hill BESS site can be accessed via Interstate 580 (I-580), West Grant Line Road, and Altamont Pass Road. There is a locked gate entrance from Altamont Pass Road, and once onsite, the Project can then be accessed via approximately 2.3 miles of unpaved access roads currently in use to access the Ralph Substation and the Sand Hill Wind Repower Project.

2.2.1.2 Site Location

The Project site is located in eastern Alameda County within the Altamont Pass Wind Resource Area (APWRA). It is located in a region of Alameda County characterized mostly by grazing and wind power production, with more recent additions of proposed BESS facilities. The area surrounding the Viracocha Hill BESS site is primarily grazing land.

The Project is located approximately 0.8 mile south of the Bethany Reservoir, ~~0.15~~ **1.8** miles north of Altamont Pass Road, and ~~3.3~~ **4.7** miles ~~west~~ **northwest** of ~~miles west of~~ the city limits of Tracy, California.

The Project will be located within an approximately 443-acre parcel (APN 99B-7300-1-5) (Township 2 South, Range 3 East, Section 11, SW 1/4 of SW 1/4) within Alameda County, California. Viracocha Hill BESS

The location and configuration of the Viracocha Hill BESS was selected to most effectively and efficiently support the adjacent Sand Hill Wind Repower Project and associated infrastructure.

2.2.1.3 Site Layout

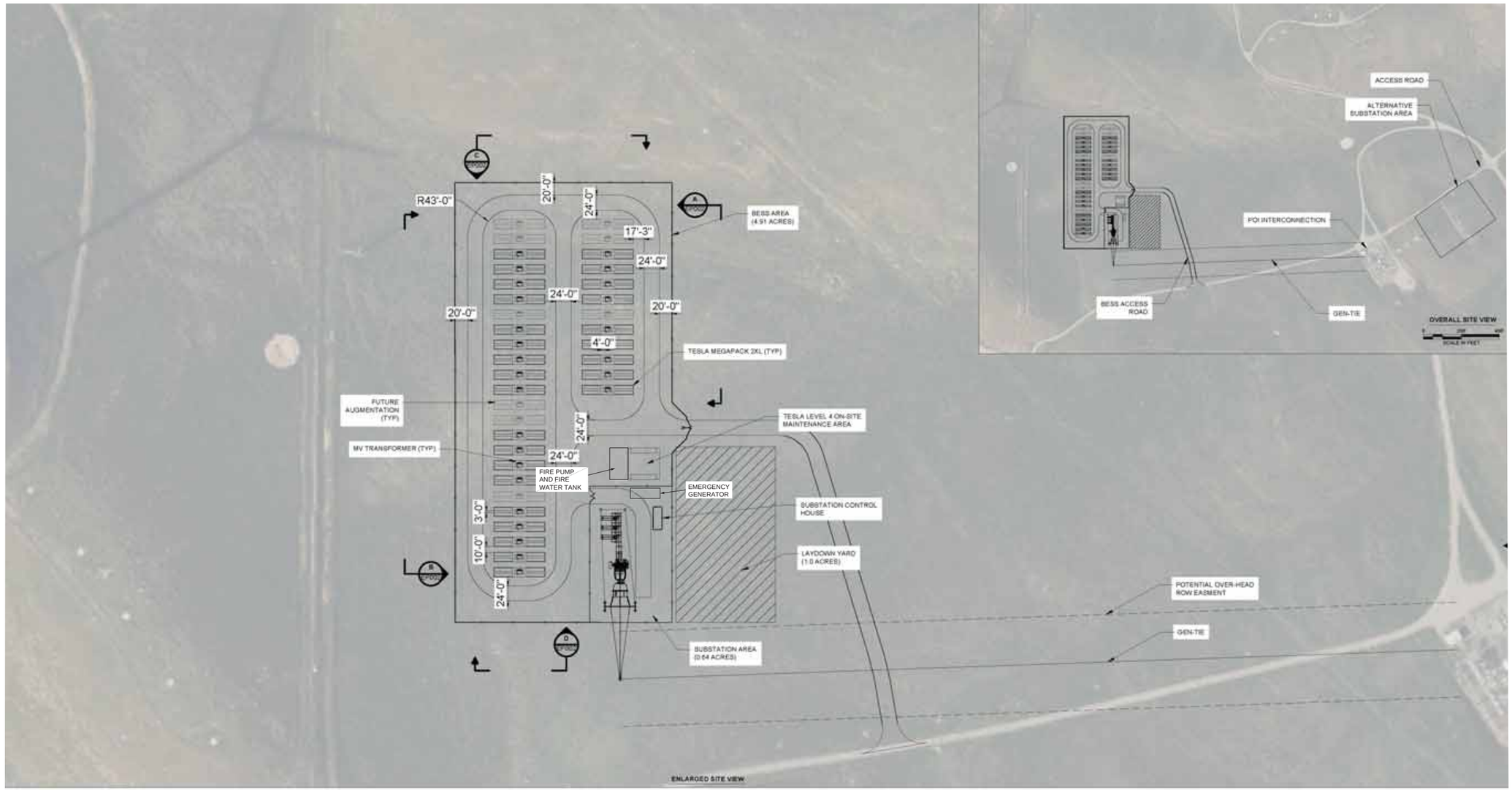
The Viracocha Hill BESS general arrangement drawing is shown on Figure 2-1. Elevation drawings of the Project are shown on Figure 2-2. The Viracocha Hill BESS will include the following elements:

- Battery units, Tesla Megapack 2XL or similar
- Medium Voltage Transformer
- Emergency Diesel Fire Water Pump
- Emergency Diesel Generator
- Fire Water Tank
- Operations and Maintenance (O&M) Pad
- Auxiliary Equipment Pad
- Onsite substation

2.2.1.4 Project Components

Battery Units

The project will consist of up to 108 Tesla Megapack 2XL, or similar, at Beginning of Life (BOL), which will follow an augmentation schedule increasing the number of Tesla Megapack 2XL to 144 at the End of Life (EOL). Augmentation for a BESS involves adding new battery modules or upgrading equipment to maintain or increase the system's energy or power capacity over time. This process addresses battery degradation and ensures the system meets performance requirements.



ENERGY STORAGE SYSTEM DESCRIPTION	
NAMEPLATE AT POI +/- 0.95PF	90.70 MW / 362.80 MWh

MATERIAL LIST	
NUMBER OF TESLA MEGAPACK 2XL (BOL)	106
NUMBER OF MEDIUM VOLTAGE TRANSFORMERS (BOL)	27
NUMBER OF TESLA MEGAPACK 2XL (EOL)	144
NUMBER OF MEDIUM VOLTAGE TRANSFORMERS (EOL)	38

LEGEND:

- FENCE
- SETBACK
- GATE
- TESLA MEGAPACK 2XL
- MEDIUM VOLTAGE TRANSFORMER

ABBREVIATION LIST:

BESS - BATTERY ENERGY STORAGE SYSTEM
BOL - BEGINNING OF LIFE
EOL - END OF LIFE
POI - POINT OF INTERCONNECTION
TYP - TYPICAL

NOTES:

1. FINAL LAYOUT SUBJECT TO CHANGE BASED ON FINAL ENVIRONMENTAL, CIVIL, GEOTECHNICAL, AND AUTHORITY HAVING JURISDICTION REQUIREMENTS.
2. EQUIPMENT QUANTITIES, CONFIGURATION, AND FOOTPRINT SUBJECT TO CHANGE BASED ON FINAL BESS TECHNOLOGY SELECTION AND ADDITIONAL PROJECT DUE DILIGENCE.
3. PARKING, TRAILERS, AND OTHER FACILITIES NOT CONSIDERED IN DEVELOPMENT OF EQUIPMENT ARRANGEMENT SHOWN.
4. WATER SUPPLY, SUCH AS TANKS, FIRE WATER LOOP, AND/OR HYDRANTS NOT INCLUDED OR CONSIDERED IN LAYOUT DEVELOPMENT.
5. WETLANDS, FLOODPLAINS, AND OTHER ENVIRONMENTAL CONSTRAINTS NOT CONSIDERED IN LAYOUT DEVELOPMENT.
6. EOL QUANTITIES ARE PRELIMINARY. FINAL EOL QUANTITIES AND AUGMENTATION SCHEDULE TO BE CONFIRMED UPON RECEIPT OF 25 YEAR DEGRADATION VALUES.
7. TESLA ON-SITE MAINTENANCE AREA ACCOUNTS FOR (2) 40 FT STORAGE CONTAINERS AND A SERVICE STAGING ZONE PER DOCUMENT "APPLICATION NOTE: ON-SITE MAINTENANCE INFRASTRUCTURE REQUIREMENTS REVISION 1.0".
8. MEDIUM VOLTAGE CONCEPTUAL TRENCHING DISTANCE OF 1930 FT IS BASED ON (6) MEDIUM VOLTAGE HOMERUN CABLES WITH AN APPROXIMATE SPACING OF 5 FT BETWEEN CABLES. PER THE CEC 2022 A MINIMUM OF 36" OF COVERAGE IS REQUIRED FROM TOP OF CABLE TO TOP OF FINISHED GRADE FOR MEDIUM VOLTAGE 34.5 KV DIRECT-BURIED CABLES. TRENCH DISTANCE, SPACING, AND BURIAL DEPTH ARE SUBJECT TO CHANGE.
9. EQUIPMENT DIMENSIONS ARE APPROXIMATE AND ARE SUBJECT TO CHANGE.
10. ALL SPACE ALLOCATED FOR FUTURE AUGMENTATION IS ANNOTATED IN GRAY.

NORTH
SCALE IN FEET

FOR PERMITTING PURPOSES ONLY

03/10/2025

Figure 2-1
General Arrangement
Viracocha Hill BESS Project
Alameda County, California

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE EP001.DWG

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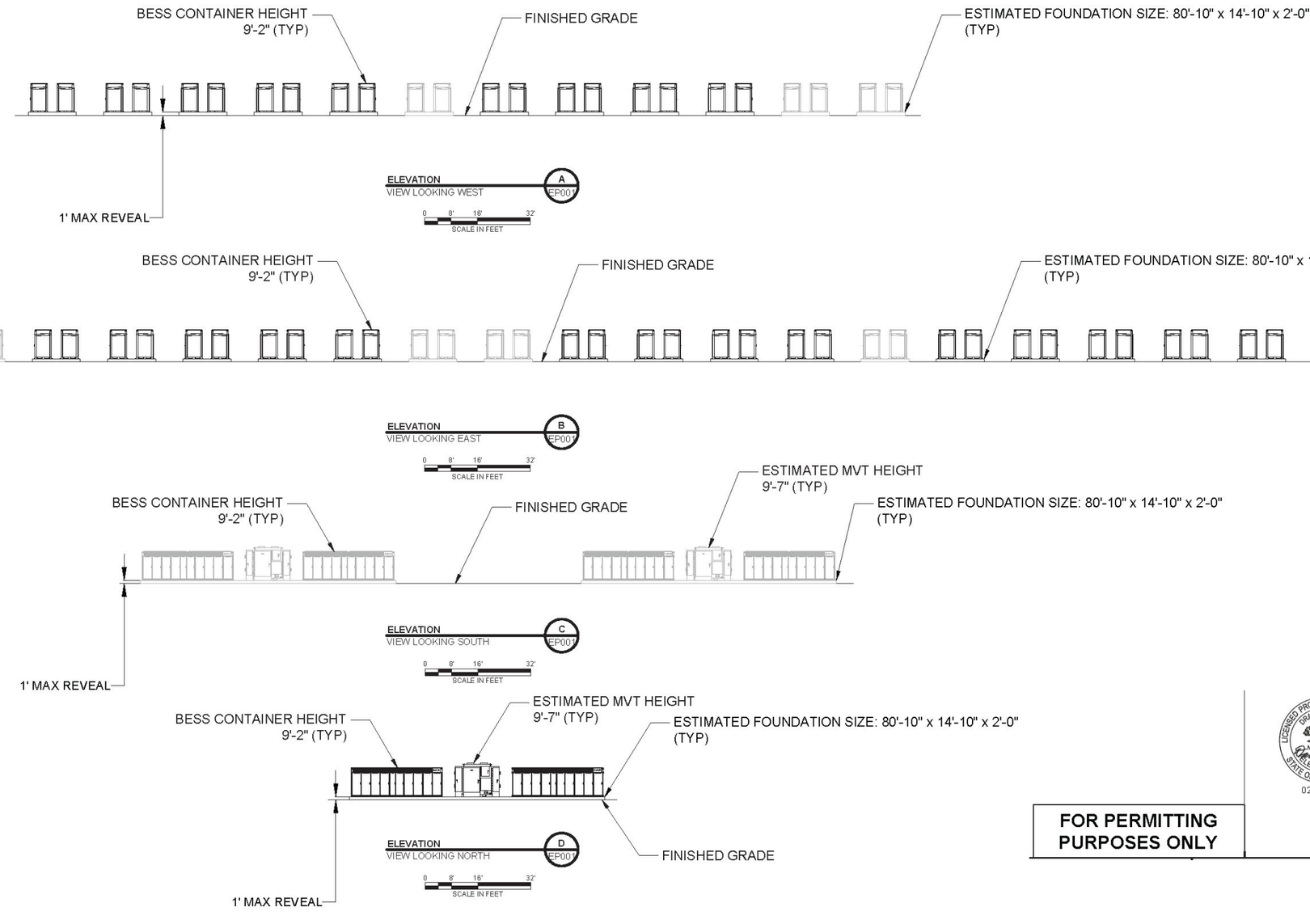


LICENSED PROFESSIONAL ENGINEER
DRAKE HUDSON
No. E 29192
ELECTRICAL
STATE OF CALIFORNIA
02/10/2025

FOR PERMITTING PURPOSES ONLY

Figure 2-2
Equipment Elevation Plan
Viracocha Hill BESS Project
Alameda County, California

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE EP002.DWG

Jacobs

Each Tesla Megapack 2XL is rated for a maximum power capability of 979 kW with a maximum energy capacity of 3,916 kWh per Megapack in a 4-hour configuration.

This will result in a total installed power of 90.70 MW at POI with up to 362.8 MW-hr at BOL.

Medium Voltage Transformer

The project will include up to 27 medium voltage transformers with capacity of up to 36.

Fire Water Pump and Tank

In the event of fire at the Project, one up to 260 horsepower (hp) fire pump will be included. The Fire Water Pump will receive water from an approximately 28,000-gallon freshwater tank. The tank will be sited near the Fire Water Pump. Prior to operations, approximately 28,000 gallons of water for the fire water tank will be trucked in via tanker trucks. Water will come from local sources including local irrigation districts and recycled water sources. The tank will be topped off as needed.

Standby Emergency Power

In case of a total loss of power, or in a situation when the utility system is out of service, the emergency electrical power for the facility will be supplied by one standby diesel engine driven emergency generator with an output of up to ~~1,340~~ **1,000** horsepower.

O&M Pad and Auxiliary Equipment Pad

O&M Pad and Auxiliary Equipment Pads will be used for the storage and staging of all necessary materials and equipment for the operation and maintenance of the facility, as well as for the temporary storage or placement of auxiliary equipment.

Onsite Substation

The onsite substation will consist of all the equipment required to collect, step-up the voltage, and connect to the grid the energy generated by the BESS facility. This includes the following equipment:

- Main power transformer
- Medium voltage (MV) switches and/or breakers
- High voltage (HV) switches and/or breakers.
- Current transformers (IT) and voltage transformers (TT)
- Metering devices
- Control room (including SCADA)
- MV and HV conductors
- Steel structures

Nonhazardous Waste Management

The construction and operation of the Viracocha Hill BESS will generate nonhazardous and hazardous waste. The hazardous materials and wastes expected to be used or generated by the facility are described in the following subsections. The construction of the facility will generate various types of nonhazardous wastes, including debris and other materials requiring removal during site grading and excavation, excess concrete, lumber, scrap metal, and empty nonhazardous chemical containers.

Solid Waste Construction

Inert solid waste from construction activities may include lumber, excess concrete, metal, cardboard, general trash, and empty nonhazardous containers. Typical management practices required for nonhazardous waste management include recycling when possible, proper storage of waste and debris to prevent wind dispersion, and weekly pickup and disposal of wastes to local Class III landfills. The total amount of solid waste to be generated by construction activities has been estimated to be similar to that generated for normal commercial construction.

Solid Waste Operations

The facility will be unmanned and visited once monthly to conduct standard O&M activities. Any solid waste generated during these visits would be consolidated and taken offsite by O&M staff. All nonhazardous wastes will be recycled to the greatest extent practical and the remainder disposed of appropriately.

Hazardous Waste Management

Small quantities of hazardous wastes will be generated over the course of construction. Table 2-1 presents the expected wastes and volumes that may be generated during construction. These may include waste paint, spent solvents, and spent welding materials. All hazardous wastes generated during facility construction and operation will be handled and disposed of in accordance with applicable laws, ordinances, regulations, and standards (LORS). Any hazardous wastes generated during construction will be collected in hazardous waste accumulation containers near the point of generation and moved to the contractor's 90-day hazardous waste storage area located onsite. The accumulated waste will subsequently be delivered to an authorized waste management facility. Hazardous wastes will be either recycled or disposed of in a licensed Class I disposal facility as appropriate. Managed and disposed of properly, these wastes will not cause significant environmental or health and safety impacts.

Some hazardous wastes will be recycled, including used oils from equipment maintenance, and oil-contaminated materials such as spent oil filters, rags, or other cleanup materials. Used oil will be recycled, and oil or heavy metal contaminated materials (for example, filters) requiring disposal will be disposed of in a Class I waste disposal facility.

The Viracocha Hill BESS will generate minimal hazardous solid waste from maintenance such as electronic components, oily rags, and lighting fixtures. The source of these solid wastes will be from O&M activities during monthly inspections. These solid wastes will be disposed of at an appropriate landfill.

Hazardous Materials Management

Construction

A variety of chemicals will be stored and used during construction of the Viracocha Hill BESS. Hazardous materials to be used during construction include unleaded gasoline, diesel fuel, oil, lubricants (for example, motor oil, transmission fluid, and hydraulic fluid), solvents, adhesives, and paint materials. There are no feasible alternatives to these materials for construction or operation of construction vehicles and equipment, or for painting and caulking equipment. The contractor will bear sole responsibility and liability for such hazardous materials brought onto or generated at the site by the construction contractor. A hazardous materials handling program will be implemented during construction in compliance with applicable LORS. Table 2-1 presents expected hazardous waste that may be generated during construction.

Table 2-1. Wastes Generated during Construction

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Scrap wood, steel, plastic, paper, and similar	Construction	Normal refuse/Universal Waste	5,000 pounds per month	Nonhazardous	Recycle and/or dispose of at a Class II or III landfill
Scrap metal	Construction	Parts, wire	**1,000 lbs/month** ~~20 tons per year~~[a]	Nonhazardous	Recycle and/or dispose of at a Class II or III landfill
Concrete waste	Construction	Solids	~~20 tons~~**500 tons during construction**	Nonhazardous	Recycle and/or dispose of at a Class II or III landfill
Empty liquid material containers	Construction	Drums, containers, totes	50 containers	Nonhazardous solids	Containers <5 gallons will be disposed of as normal refuse. Containers >5 gallons will be returned to vendors for recycling or reconditioning.
Spent welding materials (welding rods, wire, grinding wheels.)	Construction	Solids	100 pounds per month[b]	Hazardous	Recycle with vendors or dispose at a Class I landfill if hazardous.
Oily rags, oil sorbent	Cleanup of small spills	Hydrocarbons	10 pounds per month	Hazardous	Recycle at a permitted TSDF
Solvents, paint, adhesives	Maintenance	Varies	10 pounds per month	Hazardous	Recycle at a permitted TSDF
Spent lead acid batteries	Construction equipment, trucks	Heavy metals	0 batteries per year	Hazardous	Store no more than 10 batteries (up to one year) then recycle offsite
Spent alkaline and lithium-ion batteries	Equipment	Metals	10 batteries per month	Universal Waste Solids	Recycle or dispose of offsite at a Universal Waste Destination Facility
Waste oil filters	Equipment, vehicles	Hydrocarbons	0 gallons per month	Non-RCRA Hazardous Liquid	Dispose at a permitted TSDF
Sanitary waste	Portable toilet holding tanks	Sewage	600 gallons per day	Nonhazardous liquid	Remove by contracted sanitary service
Stormwater	Rainfall	Water	1.224 acre-feet[e] (from 10 year storm event)	Nonhazardous liquid	Discharge to existing permitted outfalls

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Fluorescent, mercury vapor, and LED Components	Lighting	Metals and PCBs	10 pounds per month	Universal Waste solids	Recycle or dispose of offsite at a Universal Waste Destination Facility

Note:

[a] ~~30 cubic yards~~

[b] Containers include <5-gallon containers and 55-gallon drums or totes

[e] Calculated from Alameda County Hydrology Manual for 10-year storm event

Sanitary waste based on 8 portable toilets in use

Concrete waste based on 10% of the approximate foundations for tesla Megapack 2XL containers and BOL equipment quantity of 108 containers

TSDF = treatment, storage, and disposal facility

Table 2-2. Wastes Generated during Operations

Waste	Origin	Composition	Estimated Quantity (lbs/yr)	Classification	Disposal
Fluorescent tubes	Lighting of maintenance areas	Metals	10	Universal waste solids	Recycle or dispose of offsite at a Universal Waste Destination Facility
Electronic Components	Distributed control system, BESS instruments and equipment	Metals	100 pounds per year	Universal waste solids	Recycle with an approved facility
Oily rags and sorbents	Maintenance, wipe down of equipment, cleanup of small spills	Hydrocarbons and cloth	5	Hazardous	Recycle with an approved facility or disposal by certified oil recycler
Controlled waste streams	Batteries and fire extinguishers	Controlled Substance	50	Hazardous	Recycle with an approved facility or disposal by certified waste hauler

Operation

Prior to operation, the Viracocha Hill BESS will develop and implement a Hazardous Materials Business Plan (HMBP), which will include procedures for the following:

- Hazardous materials handling, use, and storage
- Emergency response
- Spill control and prevention
- Employee training
- Reporting and record keeping

The storage, containment, handling, and use of these chemicals will be managed in accordance with applicable LORS.

Limited hazardous materials will be stored onsite during operations and will be stored within equipment. Insulating oil will be encased in the transformers, the circuit breakers will contain sulfur hexafluoride, and diesel will be stored within the fire pump engine and diesel generator's fuel tanks. Secondary containment areas will provide secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. Any chemical spills in these areas will be removed with portable equipment and reused or disposed of properly. Other chemicals will be stored and used in their delivery containers.

Safety equipment will be provided for personnel use if required during chemical containment and cleanup activities. All personnel working with chemicals will be trained in proper handling and emergency response to chemical spills or accidental releases. Absorbent materials will be stored onsite for spill cleanup. Table 2-2 presents expected hazardous waste that may be generated during operations.

Fire Protection and Safety Systems

The Viracocha Hill BESS fire protection and safety systems will be designed to limit personnel injury, property loss, and facility downtime caused by a fire or other event. The systems will be designed in accordance with:

- Federal, state, and local fire codes, occupational health and safety regulations, and other jurisdictional requirements
- California Building Code (CBC)
- Applicable NFPA standards

The fire protection system design is under way and will be developed at a later stage in the detailed design.

The fire protection system is anticipated to include a diesel-fired fire water pump. Fire water storage will be included within an approximately 28,000-gallon fire water tank, which will ensure an adequate water supply for fire protection. The onsite transformers will be protected per the NFPA by maintaining adequate separation. The fire water supply and pumping system will provide an adequate quantity of firefighting water.

In addition to the fixed fire protection system, portable carbon dioxide (CO_2) and dry chemical extinguishers will be located throughout the plant (including the switchgear rooms), with size, rating, and spacing in accordance with NFPA 10. Handcart CO_2 extinguishers also will be provided in the turbine area as necessary for specific hazards.

Local building fire alarms will be provided in accordance with NFPA 72. All materials will be free of asbestos and will meet the fire and smoke rating requirements of NFPA 255.

Plant Auxiliaries

Lighting

Lighting on the Project site will be limited to areas required for safety, will be directed onsite to avoid backscatter, and will be shielded from public view to the greatest extent practical.

All lighting that is not required to be on during nighttime hours will be controlled with sensors or switches operated such that the lighting will be on only when needed.

Lighting will be provided in the following areas:

- Outdoor equipment areas
- Transformer areas
- Perimeter roads
- Parking areas
- Facility entrance

Emergency lighting from DC battery packs will be provided in areas of normal personnel traffic to permit egress from the area in case of failure of the normal lighting system. In major control equipment areas and electrical distribution equipment areas, emergency lighting permits equipment operation to allow auxiliary power to be reestablished.

Grounding

Safety is imperative for site personnel and electrical equipment. The electrical system is protected against ground faults that result in unit ground potential rises. The station grounding system provides a path to dissipate unsafe ground fault currents and reduces the ground potential rise. The grounding conductor will be sized for sufficient capacity to reduce the most severe fault conditions to within allowable limits by reducing voltage gradients to remote earth. The ground grid spacing will be assessed to provide sufficient step and touch potentials throughout the site. Bare conductors would be installed below grade in a grid pattern. Each junction of the grid will be bonded together by either an exothermic welding process or mechanical connectors.

Ground grid impedance performed as part of the grounding study would be used to determine the necessary number of grounding electrodes and grid spacing to ensure safe step and touch potentials under fault conditions. The grounding conductor will bond the ground grid to the building steel and non-energized metallic parts of electrical equipment. Isolated grounding conductors to the ground grid will be provided for sensitive control systems.

Cathodic Protection and Lightning Protection

Cathodic protection for underground metallic piping and structures (except rebar) takes into account cathodic protection and grounding influences associated with any existing cathodic protection system to which the facility is adjacent and connected. Cathodic protection would be provided by an impressed current system, a sacrificial system, and protective coatings. Lightning protection would be furnished for buildings and structures in accordance with NFPA 78. Lightning protection for the switchyards would be in accordance with industry practice.

Distributed Control System

A Distributed Control System (DCS) would provide modulating control, digital control, and monitoring and indicating functions for operation of the proposed facility at an offsite control room.

The DCS would provide coordinated control among the BESS equipment and electrical offtaker. The BESS systems would interface with the DCS via a data link and/or hardwired input/output (I/O) devices. A sequence-of-events recorder will be an integral part of the DCS. Indication of process changes that

warrant action (process alarms), or information that the operator in the offsite control room should be made aware of (annunciation) will primarily be done by the DCS.

Thermal System

The manufacturer of the BESS system has not yet been selected and the final design of the facility has not been finalized; however, it is anticipated that if the Tesla Megapack, or similar, is selected, an external HVAC or thermal system will not be required. The thermal system is anticipated to be a self-contained closed-loop coolant (50-50 ethylene glycol-water) and refrigerant (typically R-134a) unit.

Facility Civil/Structural Features

This section describes the enclosures, structures, and other civil/structural features that will constitute the facility.

The facility will consist of the following major components:

- BESS foundations
- Medium voltage collection systems
- Onsite electrical equipment including a step-up transformer and circuit breakers
- Emergency electrical backup system including switchgear, an emergency generator, and fuel tank
- Fire protection system including a fire water loop, electric and diesel fire water pumps, and a storage tank.
- Roadways
- Security fencing and systems

The civil/structural features related to these major components are described in the following subsections.

Individual reinforced concrete foundations at grade will be used to support mechanical and electrical equipment.

Skids

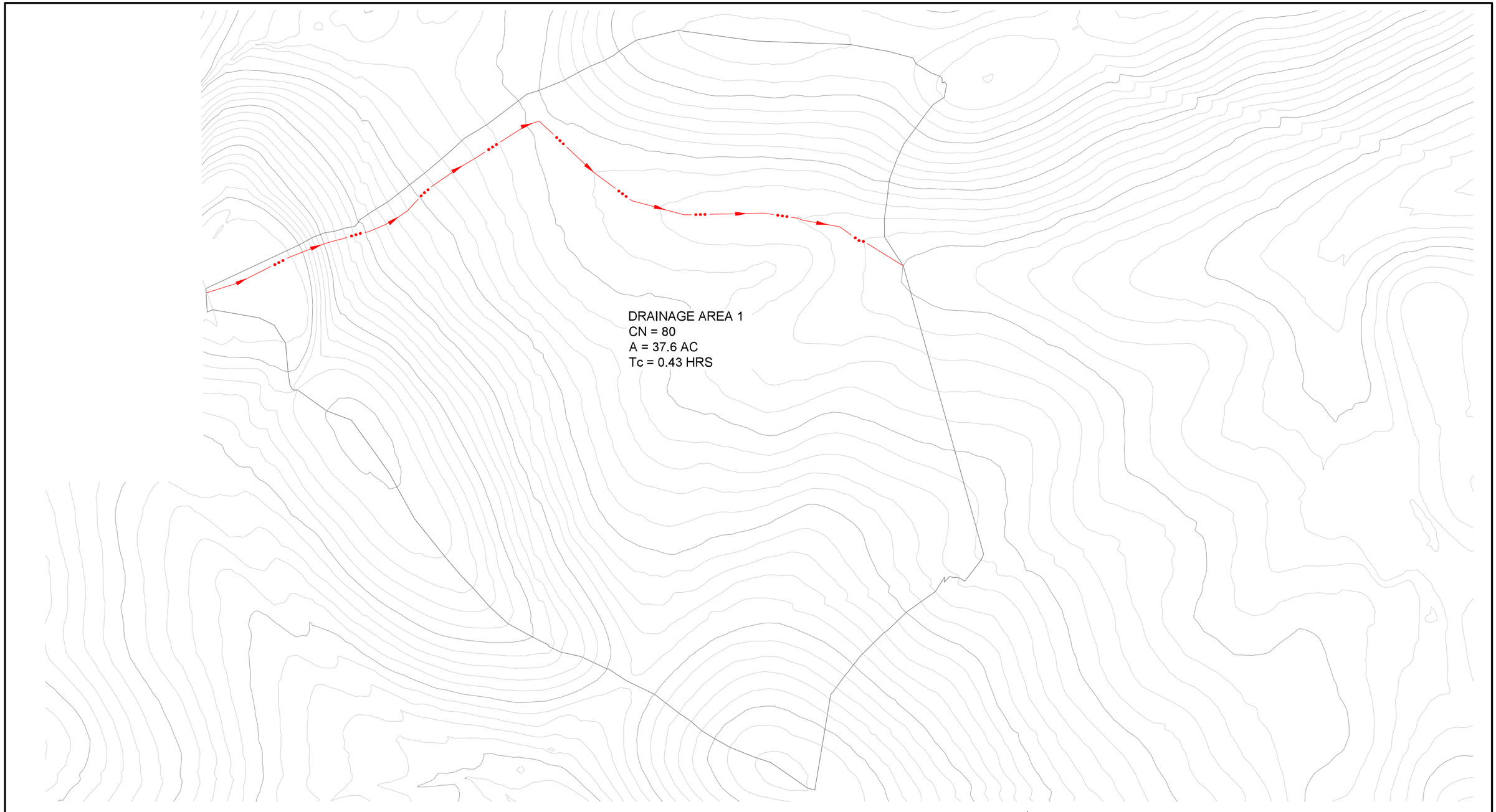
If needed, packaged skid-mounted equipment will be supported by a reinforced concrete mat foundation.

Roads

The facility will be accessed by the existing unpaved and private Wind Farm Road that services the adjacent wind farm. The main access to the facility will be via an approximately 2.1-mile-long Wind Farm Road that extends from Altamont Pass Road to the proposed Project. No improvements will be made to Wind Farm Road, however the 0.3-mile-long access road from Wind Farm Road to the BESS site will be improved by widening and graveling the existing road. The BESS yard and all in-plant roads within the fence line will be graded and graveled.

Site Grading and Drainage

The site is fairly level. The proposed drainage design in general will flow from the southwest toward the northeast portion of the site. Figures 2-3 and 2-4 show the pre- and post-construction site drainage.



NORTH

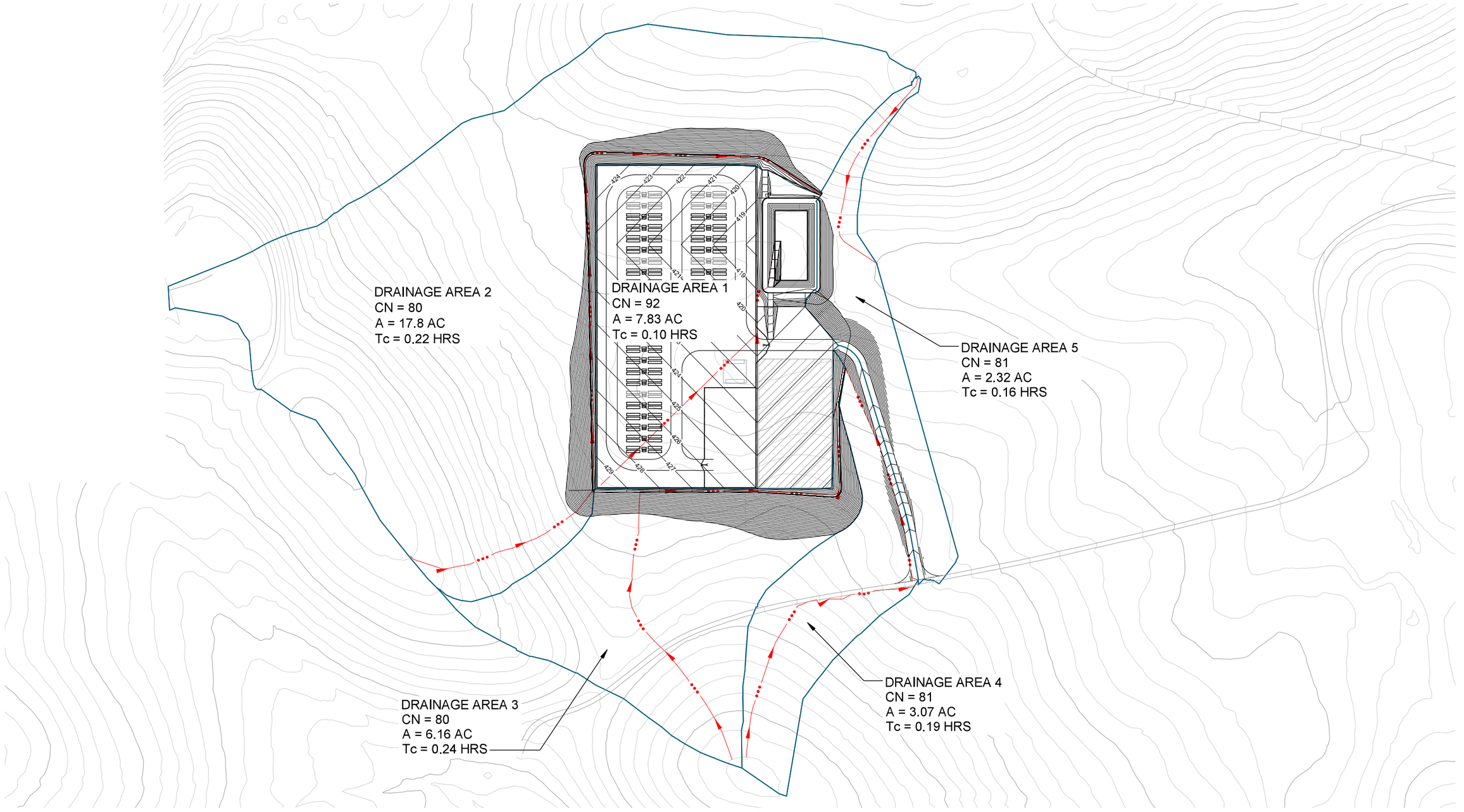
0 80' 160'
SCALE IN FEET

REFERENCE DRAWING

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE SK-C100.DWG

Figure 2-3
Pre-Construction Site Drainage
Viracocha Hill BESS Project
Alameda County, California

Jacobs



REFERENCE DRAWING

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE SK-C200.DWG

Figure 2-4
Post-Construction Site Drainage
Viracocha Hill BESS Project
Alameda County, California

Jacobs

Within the Project site equipment will be constructed on foundations with the overall site grading scheme designed to route surface water around and away from all equipment and buildings. The stormwater drainage system is sized to accommodate 3.93 inches of precipitation in a 24-hour period (100-year storm event) and to comply with applicable local codes and standards. Buildings and equipment are constructed in a manner that provides protection from the 100-year storm.

Earthwork

Excavation work will consist of the removal, storage, and disposal of earth, sand, gravel, vegetation, organic and deleterious material, loose rock, boulders, and debris to the lines and grades necessary for construction. Materials suitable for backfill will be stored in small stockpiles at designated locations using proper erosion protection methods. Excess materials will be removed from the site and disposed of at an acceptable location. Disposal of any contaminated material encountered during excavation will comply with applicable federal, state, and local regulations.

The existing site topography shown on Figure 2-3 will be graded to provide a level area for the Project site. It is assumed that excavated materials will be suitable for backfill.

Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain. Cut and fill slopes for permanent embankments will be designed to withstand horizontal ground accelerations consistent with the applicable building codes. Slopes for embankments will be no steeper than 2:1 (horizontal: vertical). Areas to be backfilled will be prepared by removing unsuitable materials and rocks. The bottom of an excavation will be examined for loose or soft areas. Such areas will be excavated fully and backfilled with compacted fill.

Backfilling will be done in layers of uniform, specified thickness. Soil in each layer will be properly moistened to facilitate compaction to achieve the specified density. To verify compaction, representative field density and moisture-content tests will be performed during compaction. All testing will be in accordance with ASTM International standards.

The depth of excavation is presented in Figures 2-5a, b, and c.

Sanitary Sewer Systems

No sanitary facilities will be located at the site once operational.

2.2.2 Construction

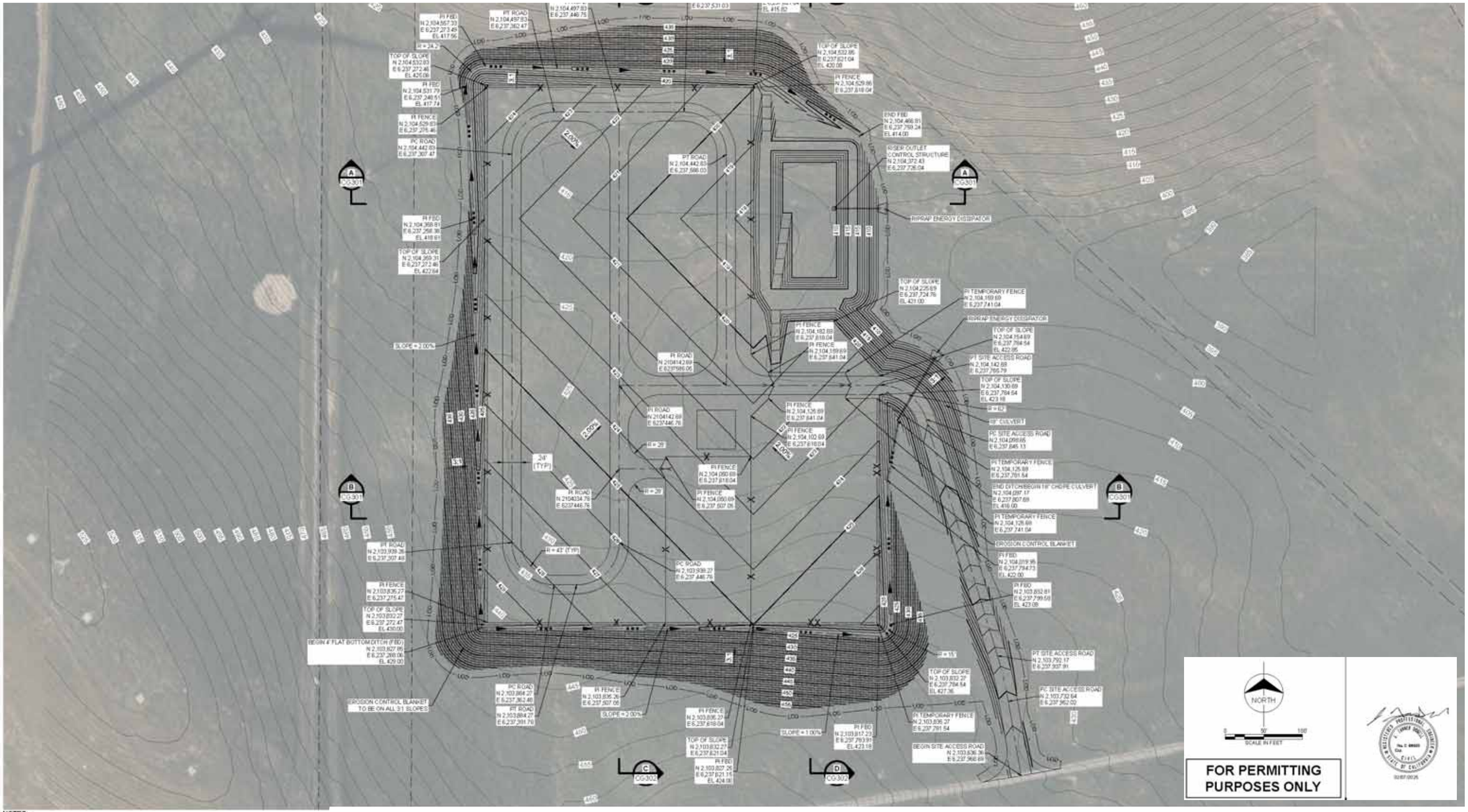
The overall project schedule for the Viracocha Hill BESS construction and commissioning is expected to take approximately 14 months. The schedule and staffing requirements are described in the following sections by major project components.

2.2.2.1 BESS Facility

Construction is anticipated to begin in the second quarter of 2026. The overall Project staffing schedule is displayed in Table 2-3 by month. The construction schedule is based on one shift, 10 hours per day, six days per week. Overtime and shift work for construction may be used to maintain or enhance the construction schedule.

Construction Facilities

Mobile trailers or similar suitable facilities (modular offices) will be used as construction offices. These construction facilities will be located at one of the nearby construction laydown areas. Visitor parking will be available in an area adjacent to the construction offices.

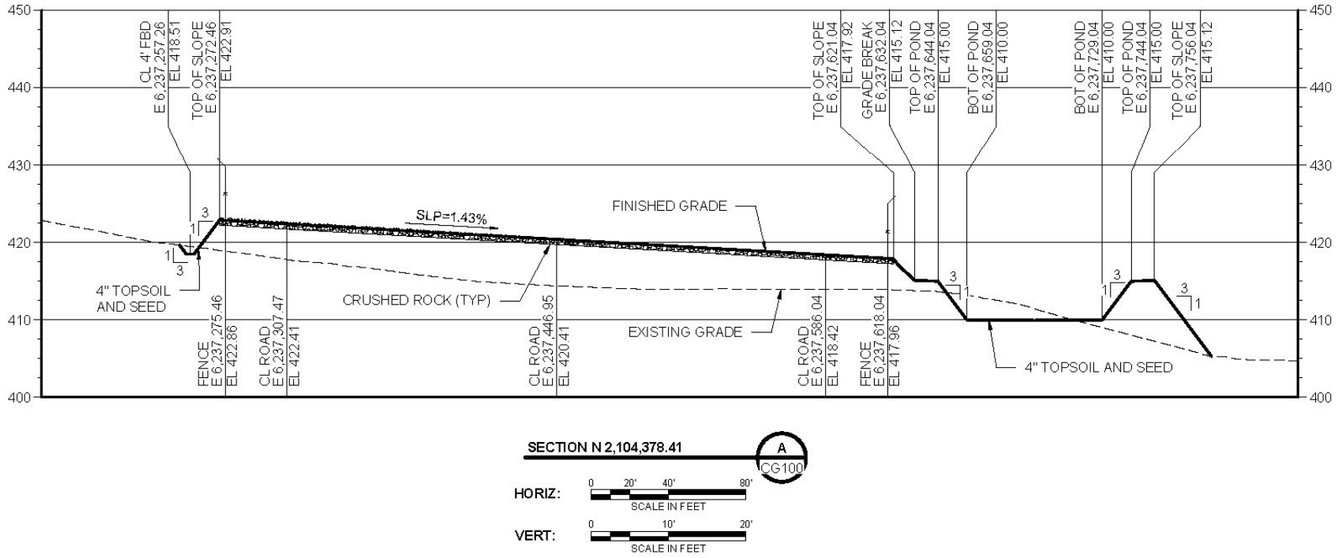


NOTES:
1 ELEVATIONS SHOWN ARE FINISHED GRADE.
2 COORDINATES BASED ON CALIFORNIA STATE PLANE, ZONE III, US FOOT.

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE CG100.DWG

Figure 2-5a
Depth of Excavation
Viracocha Hill BESS Project
Alameda County, California

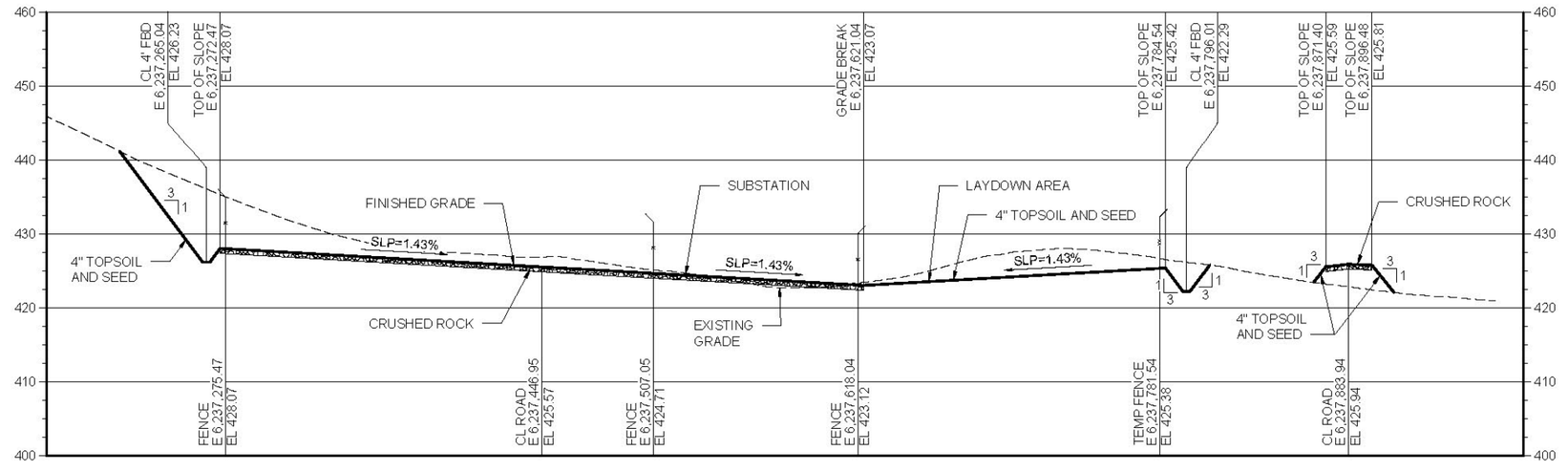
Jacobs



SECTION N 2,104,378.41 — A — CG100

HORIZ: 0 20' 40' 80' SCALE IN FEET

VERT: 0 10' 20' SCALE IN FEET



SECTION N 2,103,970.46 — B — CG100

HORIZ: 0 20' 40' 80' SCALE IN FEET

VERT: 0 10' 20' SCALE IN FEET

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE CG301.DWG

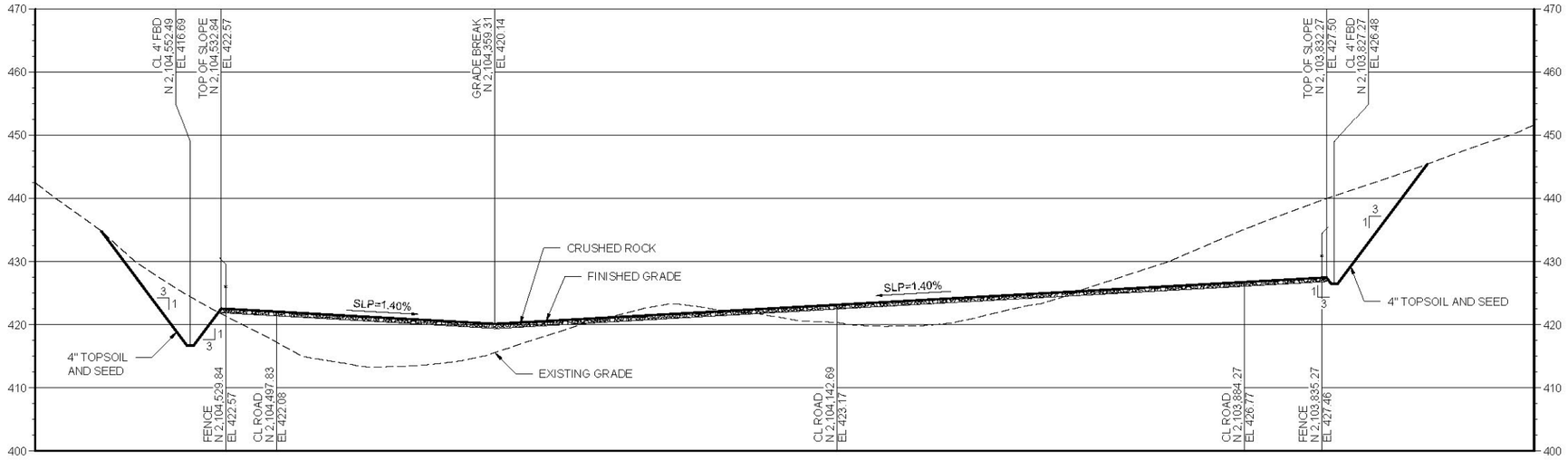
FOR PERMITTING PURPOSES ONLY

REGISTERED PROFESSIONAL ENGINEER — TANNER BIGELL — No. C 86555 Exp. — CIVIL — STATE OF CALIFORNIA

02/07/2025

Figure 2-5b
Depth of Excavation
Viracocha Hill BESS Project
Alameda County, California

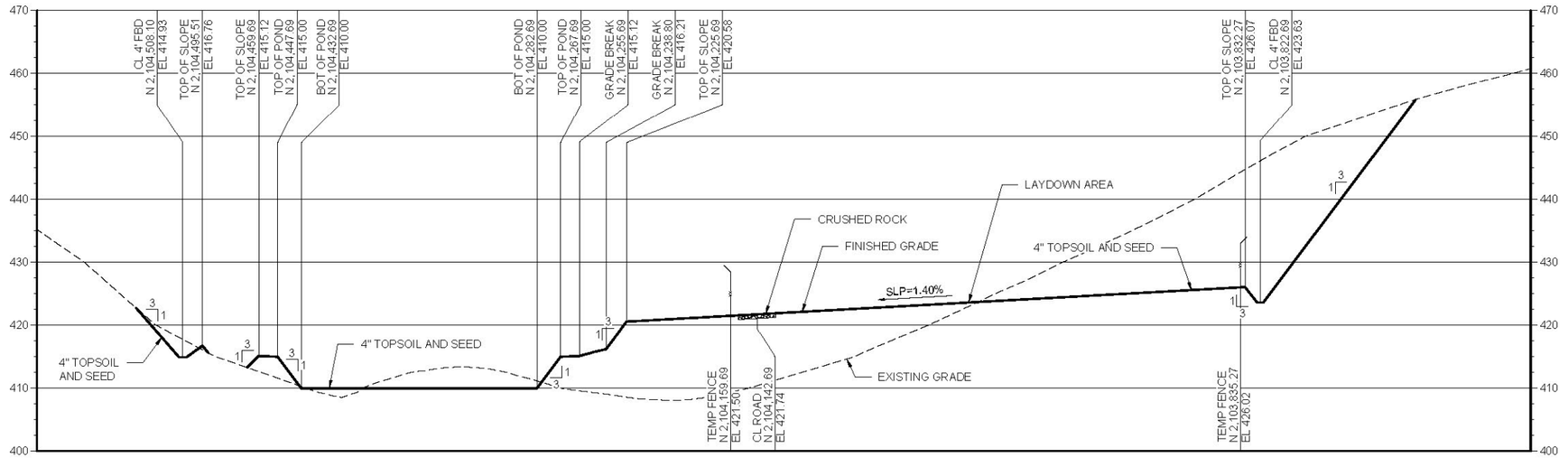
Jacobs



SECTION E 6,237,446.95 (C / CG100)

HORIZ: 0 20' 40' 80' SCALE IN FEET

VERT: 0 10' 20' SCALE IN FEET



SECTION E 6,237,695.22 (D / CG100)

HORIZ: 0 20' 40' 80' SCALE IN FEET

VERT: 0 10' 20' SCALE IN FEET

Source: BURNS & MCDONNELL 177321_SALKA_ENERGY_VIRACOCHA_HILL_BE CG302.DWG

REGISTERED PROFESSIONAL ENGINEER J. TANNER DANIELL No. C 86555 Exp. STATE OF CALIFORNIA CIVIL
02/07/2025

FOR PERMITTING PURPOSES ONLY

Figure 2-5c
Depth of Excavation
Viracocha Hill BESS Project
Alameda County, California

Jacobs

Table 2-3. Construction Workforce by Month

Construction	Months																				Man Months	Days/Mo.	Man Days	Hrs/Day	Man Hours
	Construction														Decommission/Closure										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	361	362	363	364	365	366	367					
Phases																										
Site Preparation	5																									
Grading/Civil	5	10			10	10																				
Foundation Installation		5	20	20	10																					
BESS Installation				10	10	20	30	50	50	30	20															
Substation Installation					10	10	10	16	16																	
Gen-Tie and Conductor Installation								10	10	10																
Commissioning											8	8	8	8												
Demolition															20	30	30	30	30	30	20					
Data																										
Carpenters		5	5	5	5																	20	23	460	10	4600
Laborers/Equipment Operators	10	10	10	10	10										10	20	20	20	30	30	20	200	23	4600	10	46000
Teamsters																						0	23	0	10	0
Electricians				10	20	30	40	76	76	40	28	8	8	8	10	10	10	10				384	23	8832	10	88320
Cement Finishers			5	5	5																	15	23	345	10	3450
Painters																						0	23	0	10	0
Total Craft Labor	**10**	**15**	**20**	**30**	**40**	**30**	**40**	**76**	**76**	**40**	**28**	**8**	**8**	**8**	**20**	**30**	**30**	**30**	**30**	**30**	**20**	**619**	**23**	**14237**	**10**	**142370**
Total Supervision	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**6**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**126**	**23**	**2898**	**10**	**28980**
Total Manpower	**18**	**23**	**28**	**38**	**48**	**38**	**48**	**84**	**84**	**48**	**34**	**12**	**12**	**12**	**24**	**34**	**34**	**34**	**34**	**34**	**24**	**745**	**23**	**17135**	**10**	**171350**

2.2.2.2 Construction Parking/Laydown/Storage

Construction worker parking, laydown, and storage will be within the project boundary as shown in Figure 1-4.

Emergency Facilities

Emergency services will be coordinated with the local fire department and hospital. First aid kits will be provided at the construction site and regularly maintained. As required by federal, state, and local requirements, first aid training will be provided to the appropriate staff.

Fire extinguishers will be placed throughout the Project area at strategic locations during construction.

Construction Utilities

Temporary utilities will be provided for the construction offices, the laydown and parking area, and the Project construction site. Temporary construction power at the site will be supplied by temporary generators and, as practical, utility-furnished power. Area lighting will be provided and strategically located for safety and security. Imported water will be used for construction water. Drinking water will be imported and distributed daily. Portable toilets will be provided throughout the site.

Construction Equipment and Materials Delivery

Equipment planned for use in the construction of the Viracocha Hill BESS is provided in Table 2-4. Truck deliveries will occur primarily on weekdays between 6:00 a.m. and 4:30 p.m. The estimated daily average of truck deliveries is shown in Table 2-5. Materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables will be delivered to the site by truck.

2.2.2.3 Interconnection Transmission Lines

Project Schedule and Workforce

The Project includes construction of an approximately 1,325-foot-long 230 kV electrical interconnection gen-tie line from the Viracocha Hill BESS to the Point of Interconnection at the Kelso-Tesla 230kV line via the Ralph Substation. Construction of the gen-tie line is estimated to take up to 3 months.

Gen-tie Right-of-way

PG&E requirements, the National Electrical Safety Code (NESC), and operational considerations determine the width of the ROW. Specific ROW requirements depend on the structure type, height, span, and conductor configuration. PG&E generally requires ROWs that are the height of the structure on either side of the centerline to avoid issues associated with structure failure. The single steel pole structures for the Viracocha Hill BESS lines would range from 100 to 125 feet in height, with an overall permanent ROW width of 50 feet.

Construction Activities

Construction of an interconnection gen-tie includes structure site clearing; installing foundations; assembling and erecting the structures; clearing, pulling (stringing individual lines through conductors), tensioning, and splicing sites; installing ground wires and conductors; installing counterpoise/ground rods; and cleanup and site reclamation. Various phases of construction would occur at different locations throughout the construction process. This may require several construction crews operating simultaneously in different locations. Table 2-6 lists permanent disturbance for the Project.

Table 2-4. Construction Equipment

Description	Months																			
	Construction														Decommissioning/Closure						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	361	362	363	364	365	366	367
Phases																					
Site Preparation	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grading/Civil	5	10	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foundation Installation	0	5	20	20	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BESS Installation	0	0	0	10	10	20	30	50	50	30	20	0	0	0	0	0	0	0	0	0	0
Substation Installation	0	0	0	0	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0
Gen-Tie and Conductor Installation	0	0	0	0	0	0	0	10	10	10	0	0	0	0	0	0	0	0	0	0	0
Commissioning	0	0	0	0	0	0	0	0	0	0	8	8	8	8	0	0	0	0	0	0	0
Demolition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	30	30	30	30	30	20
Data																					
Excavators			2	2	1										1	1	1	1	1	1	1
Backhoe																					
10-Wheel Dump Truck	1	1																			
Dozer	2	2			1	1									1	1	1	1			
Front End Loader	1	1			1	1									1	1	1	1	1	1	1
75-Ton Hydraulic Crane																					
35-Ton Hydraulic Crane																					
Pile Driver																					
Forklift		1	1	1	1	2	2	3	3	2	2	1	1	1	2	2	2	2	2	2	2
Grader	1	1																		1	1
Compactor	1	1	1	1	1	1															
Stake Truck																					
Water Truck	1	1	1	1																	
Pick-up Truck	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Air Compressor																					
Light Towers																					
Heavy Lift Lattice Boom Main Crane						1	1	1								1	1				
Heavy Lift Lattice Boom Tail Crane																					
Heavy Lift Gantry Crane																					

Table 2-5. Construction Truck Deliveries by month

Months	Construction														Decommissioning/Closure									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	361	362	363	364	365	366	367	Trucks per day per month	Days per Month	Total Trucks
Data																								
Fill Material	2	5				2	2															9	23	207
Mechanical Equipment																						0	23	0
Electrical Equip. & Materials								1	1	1	1	1					2	2	2			11	23	253
Concrete and Rebar		2	5	5	2												1	3	3	5	2	28	23	644
Consumables & Supplies	0.3	0.25	0.25	0.25	0.3	0.25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3								3.25	23	74.75
Contractor Mobilization	1																					0	23	0
Contractor Demobilization														1								1	23	23
Construction Equipment	1					1																2	23	46
Heavy Haul Truck Deliveries																								
Batteries						4	2								2	4						12	23	276
Total Truck Traffic																								
Trucks/Day/Month	4.3	7.3	5.3	5.3	2.3	7.3	4.3	1.3	1.3	1.3	1.3	1.3	0.3	1.3	2.0	4.0	3.0	5.0	5.0	5.0	2.0	69.5	23.0	1598.5
Trucks/Month	97.8	166.8	120.8	120.8	51.8	166.8	97.8	28.8	28.8	28.8	28.8	28.8	5.8	28.8	46.0	92.0	69.0	115.0	115.0	115.0	46.0			0
Truck Trips																								3,122

Table 2-6. Project Features and Permanent Disturbances

Project Features	Approximate Dimensions
Project Site Inclusive of Laydown and Parking (Acres)	17
Gen-Tie Line (Linear Feet)	1,325[a]
Access Road Improvements (Miles)	0.3 [a]
Road Improvements (Acres)	0.15
Alternate Substation (Acres)	2 acres

Note:

[a] Exclusive of 50-foot permanent buffer.

Structure Sites

At each structure site, leveled areas (pads) would be needed to facilitate the safe operation of equipment, such as construction cranes. The leveled area required for the location and safe operation of large cranes would be approximately 30 feet by 40 feet. At each structure site, a work area of approximately 200 square feet would be required for the location of structure footings, assembly of the structure, and the necessary crane maneuvers. The work area would be cleared of vegetation only to the extent necessary. After line construction, all pads not needed for normal gen-tie maintenance would be restored to natural contours to the greatest extent possible and be revegetated where required.

Clearing and Grading within Right-of-way

Clearing and grading would be conducted only as necessary in construction areas for the safe movement of vehicles and construction activities.

Foundation Installation

Excavations for foundations would be made with power drilling equipment. A vehicle-mounted power auger or backhoe would be used to excavate for the structure foundations. In rocky areas, the foundation holes would be excavated by drilling. Footings would be installed by placing reinforcing steel and an anchor bolt cage into each foundation hole, positioning the bolt cage, and encasing it in concrete. Spoil material would be used as fill where suitable. Spoil materials that cannot be used as fill would be removed to a suitable location by the construction contractor for disposal. The foundation excavation and installation would require access to the site by a power auger or drill, a crane, material trucks, and ready-mix trucks.

Structure Assembly and Erection

Structural steel components and associated hardware would be shipped to each structure site by truck. Steel structure sections would be delivered to tower locations where they would be fastened together to form a complete structure and hoisted into place by a large crane.

Conductor Installation

After the structures are erected, insulators, hardware, and stringing sheaves would be delivered to each structure site. The structures would be rigged with insulator strings and stringing sheaves at each ground wire and conductor position.

Pilot lines would be pulled (strung) from structure to structure and threaded through the stringing sheaves at each structure. Following pilot lines, a larger diameter, stronger line would be attached to conductors to pull them onto structures. This process would be repeated until the ground wire or conductor is pulled through all sheaves.

The shield wire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment. Sites for tensioning equipment and pulling equipment would be up to two miles apart. This distance will be essentially doubled where it is prudent to do so by pulling in two sets of conductors back-to-back.

Each tensioning site would be an area approximately 200 feet by 200 feet. Tensioners, line trucks, wire trailers, and tractors needed for stringing and anchoring the ground wire or conductor would be necessary at each tensioning site. The tensioner in concert with the puller would maintain tension on the shield wires or conductors while they are fastened to the structures. The pulling site would require approximately half the area of the tension site. A puller, line trucks, and tractors needed for pulling and temporarily anchoring the shield wires and conductor would be necessary at each pulling site.

Ground Rod Installation

Part of standard construction practices prior to wire installation would involve measuring the resistance of structure footings. If the resistance to remote earth for each transmission structure is greater than 25 ohms, additional ground rods would be installed to lower the resistance below 25 ohms.

2.2.3 Facilities, Operations, and Maintenance

The Viracocha Hill BESS is expected to have an operating life of 25 years. Reliability and availability are based on this projected operating life. The Viracocha Hill BESS will not have onsite staff but will be monitored offsite. Monthly inspections will be conducted by two staff members.

2.2.3.1 BESS Facility

Annual Operating Practices

Generally, the Viracocha Hill BESS will be operated 24 hours, 7 days per week to meet contractual obligations.

Planned maintenance will be addressed with safe operations as the primary priorities. Planned maintenance beyond these priorities will be coordinated to optimize availability and will be planned during seasonal periods when the need for electricity is reduced.

Augmentation Schedule

An augmentation schedule is a critical component of the project's lifecycle planning. It outlines how the Project will be maintained and enhanced over time to address natural battery degradation. As batteries age, their ability to store and discharge energy declines. The augmentation plan ensures that new battery modules are added or replaced as needed to maintain the system's designed capacity and meet energy delivery obligations.

The Project would have up to 409 MWh of storage when first constructed, and up to 140 MWh added at intervals during the life of the facility to maintain the nominal 362.8 MWh at the POI.

The preliminary proposed augmenting will take place in the following years:

- **Year 4** - Eight (8) Tesla Megapack 2XL, Two (2) MVT, 30.57 MWh at POI
- **Year 9** - Eight (8) Tesla Megapack 2XL, Two (2) MVT, 30.57 MWh at POI
- **Year 14** - Twelve (12) Tesla Megapack 2XL, Three (3) MVT, 45.86 MWh at POI
- **Year 22**- Eight (8) Tesla Megapack 2XL, Two (2) MVT, 30.57 MWh at POI

Degree of Automation and Control Systems

The Viracocha Hill BESS will be designed with a high degree of automation to reduce the need for onsite staff. Most equipment required to support the operation of the facility is incorporated into the BESS system with 24/7 monitoring.

2.2.3.2 Interconnection Transmission System Operation and Maintenance

Operation of the transmission system is controlled by PG&E, the regional balancing authority and transmission owner. The Point of Interconnection is at the proposed PG&E Kelso-Tesla 230kV line via the Ralph substation approximately 1,325 feet from the Viracocha Hill BESS. The Applicant will engineer, construct, own, operate, and maintain the approximately 1,325-foot-long interconnection gen-tie between the proposed Viracocha Hill BESS and the Ralph substation. Anticipated maintenance activities for the interconnection transmission system are described as follows:

- Access ways to poles and structures will be provided, as required. All access ways will be maintained to minimize erosion and to allow access by the maintenance crew.
- Land use activities within and adjacent to the gen-tie ROW will be permitted within the terms of the easement. Incompatible uses of the ROW include buildings and tall trees that interfere with required line clearances, as well as storage of flammable materials, or other activities that compromise the safe operation of the interconnection gen-tie.
- The interconnection gen-tie would be inspected regularly by both ground patrol and possibly air patrols. Maintenance would be performed as needed.
- Emergency repairs will be made if the interconnection gen-tie is damaged and requires immediate attention. Maintenance crews will use tools and other such equipment, as necessary, for repairing and maintaining insulators, conductors, structures, and access ways. When access is required for nonemergency maintenance and repairs, the Applicant would adhere to the same precautions identified for original construction.
- The buildup of particulate matter on the ceramic insulators supporting the conductors on electrical lines increases the potential for flashovers, which affects the safe and reliable operation of the line. Structures with buildup of particulate matter are identified for washing during routine inspections of the lines. Washing operations consist of spraying insulators with deionized water or limestone powder through high-pressure equipment mounted on a truck.

2.2.4 Facility Closure

Facility closure can be either temporary or permanent. Facility closure can result from two circumstances: (1) the facility is closed suddenly and/or unexpectedly because of unplanned circumstances, such as a natural disaster or other unexpected event; or (2) the facility is closed in a planned manner, such as at the end of its useful economic or mechanical life or because of gradual obsolescence. The two types of closure are discussed in the following subsections.

2.2.4.1 Temporary Closure

Temporary or unplanned closure can result from numerous unforeseen circumstances, ranging from natural disaster to terrorist attack to economic forces. For a short-term unplanned closure, where there is no facility damage resulting in a hazardous substance release, the facility would be kept “as is,” ready to restart operations when the unplanned closure event is rectified or ceases to restrict operations. If there is a possibility of hazardous substances release, the Applicant will notify the appropriate agencies and follow emergency plans that are appropriate to the emergency. Depending on the expected duration of the shutdown, chemicals may be drained from the storage tanks and other equipment. All wastes (hazardous and nonhazardous) will be disposed of according to LORS in effect at the time of the closure. Facility security will be retained so that the Viracocha Hill BESS is secure from trespassers.

Prior to the beginning of operations, the Applicant will develop a contingency plan to deal with unplanned or unexpected plant closure. This plan will include the following elements:

- Taking immediate steps to secure the facility from trespassing and encroachment
- Procedures for the safe shutdown and startup of equipment and procedures for dealing with hazardous materials, including draining of vessels and equipment and disposal of wastes
- Communication with CEC and local authorities regarding the facility damage and compliance with LORS

2.2.4.2 Permanent Closure

The planned economic life of the Viracocha Hill BESS facility is 25 years. However, if the facility were economically viable at the end of the 25 -year operating period, it could continue to operate for a much longer period. As operators continuously maintain the equipment up to industry standards, there is every expectation that the generation facility will have value beyond 25 years. It is also possible that the facility could become economically noncompetitive earlier than the planned facility's 25 -year useful life. Decommissioning activities will follow a decommissioning plan that will be developed and submitted to the CEC for review at least 12 months prior to planned facility closure. The permanent closure plan will include the following elements:

- Activities required to permanently close the facility
- A listing of all applicable LORS and a plan to comply with them
- Coordination with CEC and interested local authorities, including workshops, to coordinate closure activities
- The maximization of recycling and other proper disposal methods
- The maintenance of site security, as required

In case of permanent closure, the facility will be cleaned, and the facility components will be salvaged to the greatest extent possible. All solids will be tested. Those found to be hazardous will be transferred to a permitted Class I landfill. Nonhazardous wastes will be transferred to a permitted Class II or Class III landfill as appropriate for each waste. These solids will be managed and disposed of properly so as not to cause significant environmental or health and safety impacts.

2.3 Facility Availability, Reliability, and Safety

2.3.1 Facility Availability

The Viracocha Hill BESS will employ Tesla Megapack 2XL or similar and will be available at all times.

2.3.1.1 Range of Availability

Overall availability varies from year to year because of both unplanned causes and the structure of the overhaul cycle. Forced unavailability changes somewhat from year to year because the numbers and lengths of forced outages vary randomly. It is anticipated the facility will be moved offline in year 4 and every five years thereafter for regular maintenance during the lifetime of the facility as described in Section 2.2.3.1. The expected service life of the facility is 25 years.

2.3.1.2 Basis for Forecasts of Availability

The Viracocha Hill BESS is expected to provide a high availability and be responsive to the needs of the system for power storage. Planned outages are anticipated to occur every 4 years in seasons when energy demand is relatively low.

2.3.2 Reliability

Critical functions and parameters will have redundant sensors, controls, indicators, and alarms. The system will be designed such that critical controls and indications do not fail because of a failure in the control system implementation of redundancy logic.

Control systems in general, and especially the protection systems, will be designed according to stringent failure criteria.

The following subsections identify equipment redundancy as it applies to project availability.

2.3.2.1 BESS Facility

The BESS facility includes 108 Tesla Megapacks 2XL for a total of 102.12 MW of independent battery storage unit providing a BOL overbuilt of 12.59% sufficient to satisfy the capacity at the POI (90.7 MW) for the first 4 years. The BESS will be augmented following the augmentation schedule provided in Section 2.2.3.1 to keep the power at the POI over the minimum of 90.7 MW for the entire plant useful life of 25 year. At the EOL the plant will be composed of 144 Tesla Megapacks 2XL (or similar).

2.3.2.2 Balance of Plant Systems

The fire water system is to provide fire protection for the equipment; it includes a primary fire water pump, a backup diesel-powered pump, and the fire water pipeline system.

2.3.2.3 Operations Maintenance Plan

General Approach

During the operations phase, the Project Owner will perform all tasks necessary to operate and maintain the plant in accordance with an Operating Plan, approved procedures, and prudent, industry standards, including:

- Operations management
- Maintenance management
- Administrative support

Each of these are described in the following subsections.

Operations Management

The Project will have no onsite employees. Monthly inspections will be conducted by one to two operations staff shared between the BESS.

Staffing

Staffing plans are designed for the ongoing operational and maintenance requirements of the facility. All periodic testing, inspections, and maintenance activities will be identified, as well as those operational and maintenance requirements that require specialized and extra assistance at specific times during the maintenance cycle of the facility.

The onsite operations and maintenance staff will be supported by the home office, the engineering procurement contractors, and subcontractors for nonroutine functions. Associated technical and specialized vendor support will be subcontracted as needed during planned outages, inspections, and overhauls.

Operations and Supervision

The Operational Plan will require the following:

1. Operate the facility in accordance with the Operating Plan, Operations and Maintenance Manual, all applicable LORS and permits, and an approved annual budget and prudent industry standards.
2. Perform and record periodic operational checks and tests of equipment in accordance with approved maintenance procedures, the equipment manufacturer's specifications, and applicable laws and regulations.
3. Maintain operating logs, records, and reports for operation of the facility.
4. Coordinate scheduled shutdowns or other modifications in basic plant operations.

Ongoing Operations Training

The Project Owner will establish, implement, and conduct an ongoing operations training program. Staff will continue to receive training to maintain or improve plant reliability, availability, and capacity following Project startup.

Manufacturers' representatives and other sources of operations, maintenance, and overhaul literature will provide up-to-date information and techniques to the plant staff. Key staff members will also attend industry conferences and seminars to exchange information with other operators.

Maintenance Management Program

The Project will use a computerized maintenance/inventory management (CMIM) system. The key elements of the Project's maintenance/inventory systems will include:

- Preventive maintenance
- Predictive maintenance
- Corrective maintenance
- Augmentation schedule
- Outage management
- Spare parts inventory control

The control system will use a computerized maintenance management program to provide personnel with equipment histories, work orders, maintenance schedules, outage scheduling, inventory control, and equipment and person-hour costs.

Preventive Maintenance

Project preventive maintenance will consist of periodic equipment inspections and adjustments that will help avoid deterioration of facility performance. Preventive maintenance schedules will be included in the computerized monitoring program and will be calibrated to an overall schedule. This schedule will provide monthly and annual scheduling of necessary preventive maintenance activities and will include spare parts management.

Preventive maintenance schedules will be developed for particular pieces of equipment. The preventive maintenance schedules will be updated to reflect actual plant operating conditions, with adjustments made based on changes in key plant parameters. Equipment testing and monitoring will provide key data for the predictive maintenance component of the overall maintenance management program.

An integrated work order system will be used to schedule work and integrate the preventive maintenance into the overall maintenance management program.

Predictive Maintenance

Predictive maintenance generally improves the reliability/cost ratio and, subsequently, increases profitability by monitoring, recording, and evaluating performance systematically to develop a documented equipment and history. This history allows maintenance scheduling around critical components. Sensitive areas will receive extra attention from preventive maintenance personnel.

Corrective Maintenance

Corrective maintenance activities will return the equipment quickly to operating order. At regular discussion meetings, maintenance personnel will review and evaluate failures to avoid repeat failures. Review of the events preceding the failure allows determination of the exact causes; these findings will be fed back into the predictive maintenance model to determine whether additional or different maintenance procedures are warranted for the key components responsible for the failure.

Augmentation Schedule

The augmentation schedule shown in Section 2.2.3.1 ensures the sustained performance and reliability of the BESS by strategically adding new battery modules or upgrading key components at defined intervals. This approach accounts for expected battery degradation and aligns with operational and regulatory requirements, ensuring the system continues to meet capacity and performance targets throughout its entire lifecycle.

Outage Management

Outages for overhaul will be managed to minimize downtime through advanced planning, work packages, outage schedules, and other project management methods to allocate resources efficiently. Prior to each outage, the staff and the equipment manufacturers will conduct planned inspections beginning before the outage, depending on the need for and availability of major equipment components. Staff will work with vendor representatives to verify that the proper parts and tools are available, help coordinate inspections, and schedule work to be performed in the vendor repair shop.

A scheduling program using the critical path method will itemize various work packages, organize them, and calculate the effect any work package has on the overall outage length. The program will provide a reporting tool that allows the plant staff to create easy-to-understand outage schedules and reports showing workforce needs, equipment resources, and usage profiles. The program also will identify potential problems that could lead to schedule slippage.

Safety Program

To ensure the safety of all employees and personnel working in or near the Viracocha Hill BESS, the Applicant will establish a safety plan that conforms to federal, state, and local regulations. Key components of the plan will include:

- Site Familiarity: Employees are to be thoroughly familiar with Project operations and procedures, as well as the equipment being operated.
- Clearances: Written clearance procedures will be followed before working on or entering any equipment. No employee will work on any equipment that has been cleared for work unless the employee holds a clearance or is reporting to another employee who holds such clearance.
- Proper Equipment Designation: Equipment to be operated or worked on will be properly designated, by name and number.
- Responsibility: Operations and duties are performed only by duly authorized employees, who are held responsible for their actions.
- Monitoring: Employees will be required to maintain a continuing check on operating conditions to prevent a potential hazard to personnel and equipment. These include items such as: excessive

temperatures, over speeding of rotating equipment, abnormal noises, unusual vibration, malfunctioning of auxiliaries.

- Records: Employees who are required to keep logs and records will keep them current and maintain a high level of accuracy. Abnormal or special conditions will be called promptly to the attention of the proper supervisors and logged.

Plant Security

The Applicant will develop and implement a formal, written security plan and staff will be trained in its requirements.

2.3.3 Safety

2.3.3.1 Safety Precautions and Emergency Systems

Safety precautions and emergency systems will be included in the design and construction of the Viracocha Hill BESS to ensure safe and reliable operation of project facilities. Monitoring systems and a well-planned maintenance program will enhance safety and reliability.

Safety, auxiliary, and emergency systems consist of required lighting; battery backup for controls, fire, and hazardous materials safety systems.

Safety Precautions

Worker Safety

Programs will be in place to assure, at a minimum, compliance with federal and state occupational safety and health program requirements. In addition to compliance with these programs, ongoing implementation of a program that effectively self-assesses potential hazards and mitigates them routinely will minimize the Project's effects on employee safety.

Hazardous Materials Handling

Hazardous materials will be stored and used during construction and operation. Design and construction of hazardous materials storage and dispensing systems will be in accordance with applicable codes, regulations, and standards. Hazardous materials storage areas will be curbed or bermed to contain spills or leaks. Potential hazards associated with hazardous materials will be further mitigated by implementing a hazard communication program and thorough training of employees, including proper handling and emergency response to spills or accidental releases. Appropriate personal protective equipment also be provided.

Security

The Project will include an automated security system that will notify appropriate personnel. Firefighters and police will have access to the facility at all times.

Public Health and Safety

The programs implemented to protect worker health and safety also will benefit public health and safety. Facility design will include controls and monitoring systems to minimize the potential for upset conditions that may result in public exposure to hazardous materials. Potential public health impacts associated with operation of the Viracocha Hill BESS will be mitigated by development and implementation of an Emergency Response Plan, an employee hazards communication program, a Spill Prevention, Countermeasures, and Control Plan, safety programs, and employee training. Coordination will be made with local emergency responders by providing them with copies of the plant site Emergency Response

Plan (ERP), conducting plant site tours to point out the location of hazardous materials and safety equipment, and encouraging these providers to participate in annual emergency response drills.

Viracocha Emergency Systems

Fire Protection Systems

The Viracocha Hill BESS will have onsite fire protection systems and will be supported by local fire protection services. Portable and fixed fire suppression equipment and systems will be included in the Viracocha Hill BESS. Portable fire extinguishers will be located at strategic locations throughout the Project site. Smoke detectors, sprinkler systems, and fire hydrants with hoses will be used.

Employees will be provided with fire safety training, including instruction in fire prevention, use of portable fire extinguishers, and reporting fires to the local fire department. Employees will only suppress fires in an incipient stage. Fire drills will be conducted at least twice each year.

The Alameda County Fire Department Station 20 will provide the primary fire protection, inspections, and firefighting services for the Viracocha Hill BESS.

The Alameda County Fire Chief will perform a final fire safety inspection upon completion of construction and, thereafter, will conduct fire safety inspections. It is expected that, prior to startup, the County Fire Chief will visit the Viracocha Hill BESS site to become familiar with the site and with the plant's emergency response procedures.

Medical Services and Emergency Response

The Viracocha Hill BESS will have an Emergency Response Plan that will address potential emergencies, including chemical releases, fires, and injuries, and will describe emergency response equipment and its location, evacuation routes, reporting to local emergency response agencies, responsibilities for emergency response, and other actions to be taken in case of an emergency.

Employee response to an emergency will be limited to the awareness and first responder levels to minimize the risk of escalating the accident or injury. Training consistent with these response levels will be provided to employees. A first aid station with adequate first aid supplies and personnel qualified in first aid treatment will be provided onsite.

The Alameda County Fire Department has the primary responsibility for dispatching emergency medical technicians (EMTs). Backup EMT units are available from Mountain House Fire Station No. 1. They will respond to medical emergencies at the plant based on availability. Ambulances will be dispatched from Alameda County Fire Department Station 20. The nearest hospital is in Sutter Tracy Community Hospital; however, it is anticipated burn patients would be transported to the Santa Clara Valley Medical Center Burn Center, or similar, via helicopter.

Aviation Safety

The closest airport (Byron Airport) to the Project site is approximately 4 miles north in Contra Costa County. The airport is a public airport used for general aviation and is a popular base for skydivers, gliders and other recreational flight activities. There is no runway lighting or control tower service.

2.4 Energy and Efficiency

As detailed in Section 2.2.3.1, construction is anticipated to begin in the second quarter 2026 and run for 14 months. Details on the construction schedule and workers shifts can be found in Table 2-3. Once constructed and operational, the 362.8-MW-hr Viracocha Hill BESS facility will store energy and release it to the grid when electricity demands are high. The facility is capable of operation seven days per week, 24 hours per day over the course of its 25-year operating life.

During operations, the facility will require routine maintenance and repair, necessitating O&M staff to be onsite periodically. As the batteries degrade and lose storage capacity, they will be replaced, which may require installing new foundations, BESS and electrical equipment, all within the existing footprint.

2.5 Cumulative Impacts

Cumulative impacts are defined in the CEQA Guidelines (Section 15355) as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from a "change in the environment which results from the incremental impact of the Project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time." Consistent with CEQA Guidelines Section 15130(a), the discussion in this EIR focuses on the identification of any significant cumulative impacts and, where present, the extent to which the proposed Project would constitute a considerable contribution to the cumulative impact. CEQA Guidelines Section 15130(b) states the following:

> "The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great of detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact."

Requests for information pertaining to past, present, and reasonably foreseeable future projects were submitted to the appropriate agencies and interested parties in December 2024 and are summarized in Table 2-7. Attachment 2X includes the agency requests and responses.

Table 2-7. Cumulative Project Request - Summary of Responses

Agency/Interested Party	Date of Response	Response
Alameda County Planning Department	No response received.	No response received.
Alameda County Public Works Agency (ACPWA)	No response received.	No response received.
Bay Area Air Quality Management District (BAAQMD)	No response received.	No response received.
Planning Division of the City of Tracy	December 3, 2024	There are no major development related to the City of Tracy within 6 miles of the project. The city is approximately 11 miles east of the San Joaquin County border. City planner suggested investigating city of Mountain House projects because it is farther west and may be within the project footprint.
San Joaquin Valley Air Pollution Control District	December 12, 2024	There are currently no major projects west of the city of Tracy within the air basin.
Planning Division of San Joaquin County	No response received.	No response received.
Contra Costa County Department of Conservation and Development	December 11, 2024	After reviewing the list of projects produced from desktop research, County planner confirmed no additional projects are planned in the county.

Agency/Interested Party	Date of Response	Response
California Independent System Operator (CAISO)		CAISO provided a link to a Generation Queue Report that includes a list of projects by county/utility. A total of 12 projects are in Alameda County, 9 are in Contra Costa, and 12 are in San Joaquin County; however, the specific locations of the projects could not be provided.

To identify the projects to be analyzed in the evaluation of cumulative impacts, CEQA Guidelines Section 15130(b) requires that an EIR employ either:

- The List Approach – entails listing past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside of the control of the agency; or
- The Projection Approach – uses a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document that has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact.

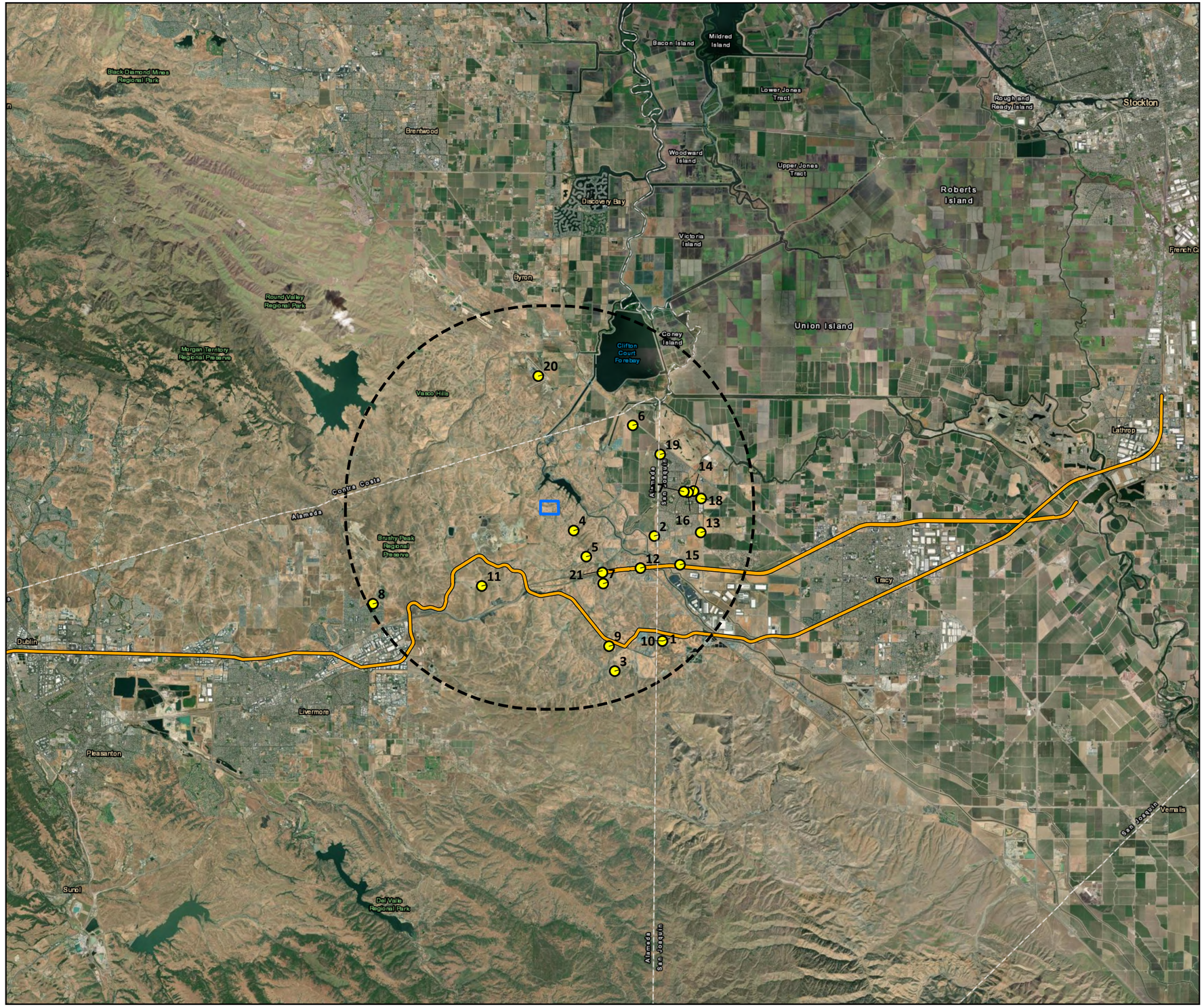
The approach and geographic scope of the cumulative impact evaluation vary depending on the environmental topic area being analyzed. The individual cumulative impacts discussion in the section addressing each environmental topic presents impacts and mitigation measures for the proposed Project. Each impact begins with a summary of the approach and the geographic area relevant to that environmental topic area. For most environmental topic areas, the list approach is used. The list of potentially relevant projects, a detailed methodology, and relevant planning documents are considered in each cumulative impact discussion.

Past projects include those land uses that have been previously developed and comprise the existing environment. Present projects include those projects recently approved or under construction. Probable future projects are those that are reasonably foreseeable, such as those for which an application is on file and in process with a local planning department. The cumulative projects listed in Table 2-9 have been determined to be reasonably foreseeable. These projects are considered in the cumulative impact analysis as appropriate. Refer to Figure 2-6, Cumulative Projects, for the location of each project considered.

Table 2-9. Cumulative Projects

Figure Reference	Project Name	Project Coordinates	Project Type	Project Status
Alameda County				
1	Griffith Energy Storage Project PA-2200137	37°42'35.94"N 121°33'14.39"W	Energy	Under review- public comment period ended 10/11/2023
2	Grant Line Solar	37°45'24.3"N 121°33'33"W	Energy	Unknown – State Review period ended 11/19/2021
3	Mulqueeny Ranch Wind Repower	37°41'46.86"N 121°34'49.84"W	Energy	Approved
4	Sand Hill Wind Project	37°45'31.53"N 121°36'16.11"W	Energy	Approved
5	Altamont Pass Wind Resource Area Repower	37°44'50N 121°35'50W	Energy	All sections approved- some sections operational

Figure Reference	Project Name	Project Coordinates	Project Type	Project Status
6	CalSun Solar Project	37°48'21.5"N 121°34'19.2"W	Energy	Unknown
7	Jess Ranch Compost Facility	37°44'7.09"N 121°35'15.19"W	Industrial	Approved
8	Garaventa Hills Project	37°43'30.0"N 121°43'00.0"W	Residential	Under review
9	Potentia-Viridi Battery Energy Storage System	37°42'26.73"N 121°35'1.95"W	Energy	Under review
10	KOLA Energy BESS	37°42'36.02"N 121°33'14.41"W	Energy	Under review
11	Rooney Ranch Wind Repowering Project	37°44'0.85"N 121°39'20.57"W	Energy	Approved
San Joaquin County				
12	I-205 Highway Widening	37°44'32.57"N 121°34'0.31"W	Roadway	Under construction – scheduled for completion in 2025
13	Mustang Square Commercial Center	37°49'38.76"N 121°37'31.44"W	Commercial	Approved
14	Aviara Apartments	37°46'37.14"N 121°32'14.66"W	Residential	Under Review
15	Grupe Apartments	37°44'38.73"N 121°32'40.46"W	Residential	Under Review
16	Vida Apartments	37°46'35.01"N 121°32'25.68"W	Residential	Under Review
17	106 residential lots	37°46'36.18"N 121°32'34.24"W	Residential	Under Review
18	143 residential lots	37°46'25.41"N 121°31'59.14"W	Residential	Under Review
19	81 residential lots	37°47'35.38"N 121°33'22.96"W	Residential	Under Review
Contra Costa County				
20	Byron Airport Development Program	37°49'44.16"N 121°37'33.96"W	Commercial	Approved
Cross County – San Joaquin and Alameda				
21	Valley Link Project	37°44'15.10"N 121°36'45.09"W	Rail	Construction set to begin in 2025



Legend

- Project Survey Boundary
- Project Study Area 6-mile Buffer
- Projects within 6 Miles
- Linear Project within 6 Miles

Source:
1) ESRI Aerial Images

N

0 5 10
Miles

Figure 2-6
Cumulative Resources
Viracocha BESS Project
Alameda County, California

Jacobs

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2.6 Applicable Laws, Ordinances, Regulations, and Standards

Refer to Appendix 2A for a detailed discussion of applicable LORS for engineering design criteria.

2.7 References

California Energy Commission. 2024. Potentia-Viridi Battery Energy Storage System. Accessed at: https://www.energy.ca.gov/powerplant/battery-storage-system/potentia-viridi-battery-energy-storage-system, on December 16, 2024.

CEQAnet. 2024. Web Portal, accessed at: https://ceqanet.opr.ca.gov/. on December 3, 2024.

Community Development Agency. 2024. CEQA projects. Accessed at: https://acgov.org/cda/planning/ceqa-projects/index.htm on December 3, 2024.

Contra Costa Conservation and Development. 2024. Planning and zoning. Accessed at: https://www.contracosta.ca.gov/8720/Planning-and-Zoning, on December 11, 2024.

Mountain House, City of. 2024. Planning. Accessed at: https://www.mountainhouseca.gov/departments/planning, on December 5, 2024.

San Joaquin Council Governments. 2024. Interactive Project Map. Access at: https://www.sjcog.org/396/Interactive-Map, on December 3, 2024.

Tri-valley Regional Rail Authority. 2024 Valley Link. Accessed at https://www.valleylinkrail.com/valleylink-project, on December 3, 2024.

3. Electrical Transmission

Section 3 Electrical Transmission was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

4. Opt-in Application Requirements

This application follows the opt-in requirements in Section 1877 of the Notice of Approval of Emergency Regulatory Action for Opt-In Regulations adopted by the California Energy Commission (CEC) on October 24, 2022. In addition, this application meets the general requirements in Title 20, Public Utilities and Energy, Section 1704(a), Information Requirements for Notices of Intent and Applications for Certification, and contains all the information specified by Title 20, Appendix B, Information Requirements for an Application for Certification (AFC) or Small Power Plant Exemption (SPPE).

To facilitate review, Title 20 Appendix B information requirement section references are included as footnotes where the required information is provided within the application. Data completeness checklists, which identify the location in this application where required information will be provided separately. The checklists will identify information requested by Title 20 Appendix B regulations that is not applicable to the Project.

4.1 PRC Section 25545(b) "Facility" Definition

The proposed Project meets the definition of "facility" in the California Public Resources Code (PRC) Section 25545(b)(2): An energy storage system as defined in Section 2835 of the Public Utilities Code that is capable of storing 200 megawatt-hours or more of electrical energy.

Reclaimed Wind, LLC (the Applicant) proposes to construct, own, and operate a 90.7-megawatt (MW) energy storage system in Alameda County, California. The 362.8-megawatt hour (MWh) proposed Viracocha Hill battery energy storage system (Viracocha Hill BESS or Project) facility will be a centralized "energy storage system" as defined in Public Utilities Code (PUC) Section 2835 and will be owned by the Applicant.

The proposed Project will be cost effective and will support the reduction of emissions of greenhouse gases, reduce demand for peak electrical generation, and improve the reliable operation of the electrical transmission or distribution grid. As described in Section 1.4, Project Benefits, the Project will provide the following key environmental and economic benefits:

- Baseload Renewable Portfolio Standard Resource: The Project is a key tool to assist California's Renewable Portfolio Standard (RPS) requirements and help fulfill the long-term needs of California and goals of Senate Bill (SB) 100. The Project will be available to receive or deliver energy 24 hours a day and 365 days per year, allowing for the injection of energy into the grid to be shifted during pivotal moments when demand exceeds real-time generation supply.
- Reliability Support for the California Grid: As RPS goals increase, a larger portion of the power mix will be supplied by intermittent and weather-dependent resources; firm clean power will become a critical piece of the power mix. The Project will support these resources, providing energy storage to the California grid.
- Local Economic Benefits: Once operating, the Project will not significantly impact local housing, educational, or emergency response resources. A comprehensive outline for the community benefits plan is provided as Appendix 4A.

The Project will use lithium iron phosphate (lithium ferrophosphate, LFP) batteries to facilitate a chemical process to store energy. The electrical energy generated by power projects throughout the state will be converted to chemical potential energy stored within the battery for use at a later time. When the energy is needed, the battery will discharge the chemical potential energy converting it to electrical energy to travel within a transmission line.

4.2 PRC Sections 25545.3.3 and 25545.3.5 Labor Code Certifications

Sections 25545.3.3 and 25545.3.5 require an application to include a certification relating to specific commitments concerning labor used to construct the facility. The Applicant is required to "certify" that the construction of the covered project is not in its entirety a public work for purposes of Chapter 1 (commencing with Section 1720) of Part 7 of Division 2 of the Labor Code. A "covered project" or "project" means a site and related facility subject to an application submitted under Chapter 6.2. Certification of Nonfossil-Fueled Powerplants, Energy Storage Facilities, and Related Facilities [25545 - 25545.13]. The Applicant further certifies that the Project will be constructed pursuant to a project labor agreement (PLA) and that the terms of the PLA will comply with Section 25545.3.3 (b) (6) and Section 25545.3.5 (e) and therefore will meet the requirements of all the applicable provisions of Section 25545.3.

This application contains all certifications required by PRC Sections 25545.3.3 and 25545.3.5. In connection with the opt-in application for the Project in Alameda County, California, Reclaimed Wind hereby certifies that it will comply with the prevailing wage and workforce requirements set forth in Assembly Bill (AB) 205 (2021, including that (1) all construction workers employed on the Project will be paid at least the general prevailing rate of per diem wages or apprenticeship wages, as applicable, in accordance with PRC Section 25545.3.3, and (2) a skilled and trained workforce will be used to perform all construction work on the Project, in accordance with PRC Section 25545.3.5. Refer to Appendix 4B, Labor Certification, for more details.

4.3 Federal, State, and Local Permit Applications

This section summarizes the federal, state, and local permits and approvals that have been submitted, or may be required, to implement the proposed Project. Local permitting is subsumed by the CEC under AB 205. A list of permits that will otherwise be required from local agencies, if not for AB 205, are listed in Section 4.3.3. Appendix 1D identifies permits, submittal plan and agency discussion.

4.3.1 Federal Permit Applications

The Project does not have a federal nexus. Conversations are under way between the Applicant and the U.S. Fish and Wildlife Service to discuss preparation of a Section 10 permit for the Project.

4.3.2 State Permit Applications

The following state applications are required:

CEC: The CEC will serve as the California Environmental Quality Act (CEQA) lead agency for the Project. After CEQA is complete, the CEC issues a final Environmental Impact Report (EIR) and license for the project.

State Water Resources Control Board (SWRCB): The SWRCB and the Central Valley Regional Water Quality Control Board (CVRWQCB) have a Memorandum of Understanding (MOU) with the CEC per the provisions of PRC 25545.5. The Project will apply for a National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, and under the MOU the CVRWQCB is required to take action on the facility within 90 days after the certification of the final EIR by the CEC.

California Public Utilities Commission (CPUC): Project interconnection upgrades are required to be owned in part by Pacific Gas and Electric Company (PG&E). The CPUC will have jurisdiction over approval of the interconnection portion of the Project, pursuant to General Order 131-D, and may rely on this application and the CEC's analysis to fulfill its CEQA review obligations of any substation or interconnection facility improvements under its jurisdiction that are necessary to serve the Project. PG&E will be responsible for this submittal and coordination with CPUC after the CEC issues its Decision on the Application.

4.3.3 Local Permit Applications

The Project includes a fire water pump and an emergency generator that will require permits through the Bay Area Air District (BAAD). Once the final manufacturer has been selected permit applications will be submitted to the BAAD.

4.4 Project Is Not on a Prohibited Site

The Project is not on a prohibited site as identified in PRC Section 25527, on a site designated by the California Coastal Commission under PRC Section 30413(b), or on a site designated by the San Francisco Bay Conservation and Development Commission (BCDC) under Government Code Section 66645(b). Additionally, a public agency does not have ownership or control of the land where the Project is located. Refer to Section 5.6, Land Use, for additional information.

4.4.1 PRC Section 25527 Compatible Land Use

PRC Section 25527 states the following areas should not be approved as a site for a facility:

- State, regional, county, and city parks
- Wilderness, scenic, or natural reserves
- Areas for wildlife protection, recreation, historic preservation
- Natural preservation areas
- Estuaries in an essentially natural and undeveloped state

The Project site is located on a private parcel that has been historically used for grazing and does not meet any of the criteria above. See Section 4.11, Land Use and Planning, for additional information regarding the Project site characteristics and designations.

4.4.2 PRC Section 30413(b) California Coastal Commission Jurisdiction

PRC Section 30413(b) requires the California Coastal Commission to designate specific locations within the coastal zone where the location of a facility as defined in Section 25110 would prevent the achievement of California Coastal Act objectives.

The Project site is not located in or near the coastal zone as defined by PRC Section 30103(a).

4.4.3 Government Code Section 66645(b) San Francisco BCDC Jurisdiction

Government Code Section 66645(b) requires the San Francisco BCDC to designate specific locations within the Suisun Marsh or their area of jurisdiction where the location of a facility as defined in Section 25110 would be inconsistent with the Suisun Marsh Protection Plan or the San Francisco Bay Plan.

The Project site is not located in or near the Suisun March or BCDC's area of jurisdiction as defined by Section 66645(b).

4.5 Overall Net Positive Economic Benefit to the Local Government

Preliminary information demonstrates an overall net positive economic benefit to Alameda County, the local government that will have had permitting authority over the site and related facility, consistent with PRC Section 25545.9. Refer to Appendix 4A for the comprehensive outline for the Community Benefits Plan and Appendix 4B for the Proposed Labor Certification detail.

Potential benefits may include, but are not limited to the following:

(a) Employment growth.

(b) Infrastructure and environmental improvements.
(c) Property taxes and sales and use tax revenues.

4.5.1 Employment Growth

Net economic benefits related to employment growth are estimated by comparing the Project with the most recent use of the Project site, which was for grazing and development of wind farms.

Project construction and commissioning will result in a one-time, short-term net economic benefit of approximately 441 direct jobs (annual) and up to 50 total (indirect and induced) jobs. As there will be no onsite operational employees, employment growth is negligible as discussed in Section 5.10, Socioeconomics. Direct impacts are those supported by expenditures made by the onsite activity (for example, construction or farm labor). Secondary (indirect and induced) impacts are those supported elsewhere in the local economy.

4.5.2 Infrastructure and Environmental Improvements

The Project will improve grid reliability by being available during periods of high demand or when generation is down. Furthermore, the Project will help reduce the amount of systematic curtailment that currently takes place for wind and solar projects on the California Independent System Operator grid due to oversupply during the day.

LFP batteries are a preferred choice for utility-scale energy storage systems because of their unique characteristics:

- Superior Safety: LFP batteries offer exceptional safety features, including excellent thermal stability and a reduced risk of thermal runaway compared to other lithium-ion chemistries. This ensures safe and reliable operation of the BESS.
- Long Cycle Life: LFP batteries can withstand a high number of charge-discharge cycles without significant capacity degradation. They have a longer lifespan, reducing the need for frequent battery replacements.
- High Energy Density: LFP batteries possess a high energy storage capacity, allowing for the efficient storage of large amounts of electricity within a compact footprint. This makes them ideal for projects requiring high energy output and limited physical space.
- Fast Charging Capability: LFP batteries can be charged at high rates, enabling quick replenishment of energy ahead of periods of high demand or when renewable energy sources are generating excess electricity.

4.5.3 Property Taxes and Sales and Use Tax Revenues

Net economic benefits related to property tax, sales tax, and use tax revenues are estimated by comparing the Project with the most recent the Project site use, which has historically been grazing. A full analysis may be found in Section 5.10, Socioeconomics.

Property taxes. Following construction, the Project will result in an estimated net economic benefit of $1.5 million in property tax revenues in its first full year of operation. Viewed over the 30-year operating life, the Project will result in a total estimated net benefit of $45 million relative to the former use.

Sales and use tax revenues. Project construction and commissioning will result in an estimated one-time net economic benefit of $512,500 to $1,025,000 in sales and use tax revenues to the state compared to the most recent use of the Project site, with an estimated $150,000 to $300,000 of this total paid to Alameda County. Following construction, local expenditures associated with Project operations will generate small amounts of sales tax during a typical operational year that could potentially result in a small net gain relative to the former site use as well as property taxes for the project site.

4.6 Legally Binding and Enforceable Agreement(s) to Benefit Community-based Organizations

The Applicant aspires to be an active member and steward of the communities where developing, owning, and operating clean energy projects. In every project development area, the Applicant actively seeks to fund community-based organizations that focus on education programs, health and human service organizations, conservation and sustainability initiatives, and community-specific needs. The Applicant emphasizes a "Community First" approach to development, making sure to reach out to local stakeholders for input at the earliest stages of development and throughout the life of a project. They create long-term relationships and positive impacts that serve local communities.

As part of the Project, the Applicant plans to make significant investments with community-based initiatives and programs in the Alameda and San Joaquin County area. The Applicant project team is actively researching local community-based organizations that align with the Applicant's company-wide social investment strategy. As described in the comprehensive outline of the Community Benefits Plan, the Applicant proposes to meet with multiple Alameda County-based community organizations to better understand their immediate and long-term needs and how their missions directly support the residents of the surrounding communities.

4.7 PRC Sections 21183 and 21183.6 ELDP and Greenhouse Gas Emissions Requirements

The Project meets the requirements of PRC Sections 21183 and 21183.6 to qualify as an Environmental Leadership Development Project (ELDP) and to reduce the emissions of greenhouse gases for the following reasons:

PRC Section 21183(a). The Project qualifies by planning to comply with PRC Section 21183(a) with an investment in California upon completion of construction that is anticipated to far exceed one hundred million dollars ($100,000,000). See Section 5.10, Socioeconomics, of this Application for the Project's capital investment.

PRC Section 21183(b). The Applicant will comply with the prevailing wage and workforce requirements set forth in AB 205, including that (1) all construction workers employed on the Project will be paid at least the general prevailing rate of per diem wages or apprenticeship wages, as applicable, in accordance with PRC Section 25545.3.3, and (2) a skilled and trained workforce will be used to perform all construction work on the Project, in accordance with PRC Section 25545.3.5. The Project will be constructed in accordance with a PLA that will comply with Section 21183(b). The Project will create high-wage, highly skilled jobs that pay prevailing wages and living wages, which will provide construction jobs and permanent jobs for Californians. These jobs will help reduce unemployment and promote apprenticeship training. Refer to Appendix 4B, Proposed Labor Certification.

PRC Section 21183(c). The Project is a renewable energy project, as defined in paragraph (2) of subdivision (b) of Section 21180, and will not result in any net additional emission of greenhouse gases when considering the entire Project. The Project will emit limited greenhouse gas emissions during construction and during operations and maintenance for vehicles and maintenance equipment. As described in Section 5.1, Air Quality, and Section 5.9, Public Health, and associated appendices, the Project will not result in any net additional emissions of greenhouse gases. The Project will comply with the greenhouse gas emissions quantification and mitigation in Section 21183.6.

PRC Section 21183(d). The Project will comply with the requirements of recycling commercial solid waste and organic solid waste as required under PRC Sections 42649 and 42649.8. The stated regulations refer to commercial waste recycling (Chapter 12.8) and recycling of organic waste (Chapter 12.9). The Applicant will ensure that recycling of commercial and organic waste are stipulations in the construction contractor's contract. Construction materials will be sorted onsite throughout construction and transported to appropriate waste management facilities. Recyclable materials will be separated from

nonrecyclable items and stored until they could be transported to a designated recycling facility. Recycling will be in accordance with applicable California state requirements. Wooden construction waste (such as wood from wood pallets) will be sold, recycled, or chipped and composted. Other compostable materials, such as vegetation, may also be composted offsite. Non-hazardous construction materials that cannot be reused or recycled likely will be disposed of at a Class II/III landfill. All contractors and workers will be trained in waste sorting, appropriate recycling storage areas, and how to reduce landfill waste. The potential waste streams that will be generated during construction and operation of the Project, the waste classifications, and disposal facilities are detailed in Section 5.14, Waste Management. Furthermore, the Project must comply with the California Green Building Standards Code, also known as CALGreen, which includes mandatory recycling. Code Section 5.408 requires that 65% of the nonhazardous waste be recycled or salvaged for reuse. Code Section 5.408.3 (excavated soil and land clearing debris) requires that 100% of trees, stumps, rocks, and associated vegetation and soils resulting from land clearing shall be reused or recycled. Additionally, solid waste generated by the Project will be collected and disposed of by a collection firm in conformance with the California Integrated Waste Management Act of 1989. Applicable laws and regulations related to waste handling are detailed in Section 5.14.

PRC Section 21183(e). By filing this Opt-In Application with the CEC, the Applicant agrees to be legally bound by the terms and conditions of the CEC license, thereby satisfying Section 21183(e). Therefore, the Applicant will abide by all mitigation measures required under this division to certify the Project under this chapter. AB 3180 was enacted by the California State Legislature in 1988 to provide a mechanism to ensure that mitigation measures adopted through the CEQA process are implemented in a timely manner and in accordance with the terms of project approval. Under AB 3180, which added Section 21081.6 to CEQA, public agencies are required to adopt a monitoring or reporting program designed to ensure compliance during project implementation. This program is required to be adopted when the public agency is making required findings after consideration of the final EIR (PRC Section 21081.6 and CEQA Guidelines Section 15091). A mitigation monitoring and reporting program (MMRP) will be prepared for the Project in compliance with PRC Section 21081.6. In accordance with state law, the Project MMRP will identify the action being monitored, responsibility for implementation, the schedule for implementation, and the mechanism that verifies that monitoring is complete. The CEQA mitigation measures in the final EIR and MMRP will be incorporated into the Conditions of Certification that will be required as part of the Project certification to construct and operate the facility issued by the CEC. Conditions of Certification will be binding and implemented during preconstruction compliance, construction, operations, and decommissioning. The CEC will monitor and enforce implementation.

PRC Section 21183(f) and PRC Section 21183(g). The Applicant agrees to pay the court and record preparation costs identified in Sections 21183 (f) and (g).

PRC Section 21183(h). The environmental review of the project has not commenced prior to the Opt-in Application filing. Therefore, the Applicant is not required to demonstrate that a record of proceedings was being prepared in accordance with PRC Section 21186.

PRC Section 21183.6(a). The greenhouse gas emissions baseline is described in Section 5.1, Air Quality. Refer to Section 5.1, Air Quality, and Section 5.9, Public Health, and associated appendices. The Project will not result in any net additional emissions of greenhouse gases. A net greenhouse gas reduction will occur as a result of implementing the Project. Therefore, no mitigation will be required, and the Project will comply with PRC Sections 21183.6(a)(2) and (b).

5. Environmental Analysis

This chapter contains 17 individual sections that have been submitted in two parts as identified below. This table identifies those sections that were submitted previously as TN# 261781, and those that are included within this second submittal.

Table 5-1. Summary of Sections in Submittals 1 and 2

Section	Section Name	Status
1	Executive Summary	Docketed 2/14/25, TN# 261781
2	Project Description	Docketed 2/14/25, TN# 261781 Updated in Submittal Package #2, Volume 1
3	Electrical Transmission	Docketed 2/14/25, TN# 261781
4	Mandatory Opt-In	Provided in Submittal Package #2, Volume 2
5	Environmental Analysis	NA
5.1	Air Quality	Provided in Submittal Package #2, Volume 2
5.2	Biological Resources	Provided in Submittal Package #2, Volume 2
5.3	Cultural Resources	Docketed 2/14/25, TN# 261781
5.4	Geological Hazards and Resources	Docketed 2/14/25, TN# 261781
5.5	Hazardous Materials Handling	Docketed 2/14/25, TN# 261781
5.6	Lane Use	Docketed 2/14/25, TN# 261781
5.7	Noise	Provided in Submittal Package #2, Volume 2
5.8	Paleontological Resources	Docketed 2/14/25, TN# 261781
5.9	Public Health	Provided in Submittal Package #2, Volume 2
5.10	Socioeconomics	Provided in Submittal Package #2, Volume 2
5.11	Soils and Agricultural Resources	Docketed 2/14/25, TN# 261781
5.12	Traffic and Transportation	Docketed 2/14/25, TN# 261781
5.13	Visual Resources	Provided in Submittal Package #2, Volume 2
5.14	Waste Management	Docketed 2/14/25, TN# 261781 Updated in Submittal Package #2, Volume 2
5.15	Water Resources	Docketed 2/14/25, TN# 261781
5.16	Wildfire	Docketed 2/14/25, TN# 261781
5.17	Worker Health and Safety	Docketed 2/14/25, TN# 261781
6	Alternatives	Docketed 2/14/25, TN# 261781

The sections represent the standard environmental, public health and safety, and local impact assessment disciplines for which the California Energy Commission (CEC) Energy Facilities Siting Regulations (Title 20, California Code of Regulations, Section 1704, Appendix B) require information in an Opt-In Application. Most of the sections use a standardized format containing the following headings and associated content:

- **Affected Environment** includes relevant background information about the Viracocha Hill Battery Energy Storage System's (Viracocha Hill BESS or Project) environmental, social, and regulatory settings.

- **Environmental Analysis** addresses the potential environmental consequences of the construction and operation of the Project. The section begins with a list of the criteria used to determine whether environmental effects of the Project qualify as significant adverse environmental impacts.
- **Cumulative Effects** discusses potential effects of the Project that are not significant adverse impacts individually, but which could reach significance cumulatively in combination with other projects in the area.
- **Mitigation Measures** describes any mitigation measures necessary to reduce potential impacts to a level less than the level of significance.
- **Laws, Ordinances, Regulations, and Standards (LORS)** lists those items that pertain to the Project for a given discipline and includes a demonstration that the Project, as designed, would comply with all applicable LORS.
- **Agencies and Agency Contacts** is a list of federal agencies with permitting authority over the Project, and state and local regulatory agencies that would have such permitting authority, except for the exclusive purview of the CEC. This section also contains a list of regulatory agency staff and their locations.
- **Permits and Permit Schedules** identifies applicable permits and their schedules.

5.1 Air Quality

This section presents the methodology and results of an analysis performed to assess the potential impacts of airborne emissions from the construction and operation of the Viracocha Hill Battery Energy Storage System Project (Viracocha Hill BESS or Project) and the Project's compliance with applicable air quality requirements.

Section 5.1.1 presents an overview of the Project as it relates to air quality. Section 5.1.2 provides a description of the Project. Section 5.1.3 presents the existing site conditions including geography, topography, climate, and meteorology. Section 5.1.4 summarizes the air quality standards for criteria pollutants and descriptions of greenhouse gases (GHG). Section 5.1.5 summarizes the existing air quality near the Project. Section 5.1.6 presents the Project's criteria pollutant and GHG emissions estimates. Bay Area Air District (BAAD) new source review rules applicable to the Project are summarized in Section 5.1.7. Section 5.1.8 presents the best available control technology (BACT) evaluation for the Project. Section 5.1.9 presents the air quality impact analysis methodology. The air quality impact analysis results are presented in Section 5.1.10. Section 5.1.11 presents applicable federal, state, and local laws, ordinances, regulations, and standards (LORS). Section 5.1.12 presents agency contacts. Section 5.1.13 presents permit requirements and schedules. Section 5.1.14 contains references cited or consulted in preparing this section. Appendix 5.1A contains the support data for the Project's construction and operational emissions calculations. Potential public health risks posed by emissions of toxic air contaminants (TACs) are addressed in Section 5.9.

5.1.1 Project Overview

The Project would construct and operate an up to 362.8-MW-hr BESS in Alameda County, California, adjacent to the proposed Sand Hill Wind Repower Project (to be constructed, owned, and operated by an affiliate of the Applicant). The Project includes a fenced BESS yard which will include a 362.8 megawatt-hour (MWh) BESS facility, improvements to an existing access road, Project substation and a new proposed gen-tie line. If expanding the existing Ralph Substation is not feasible, a new switching station or a line-tap located adjacent to the Ralph Substation would be included as part of the project. Figure 1-1 shows the Project location regionally, and Figure 1-4 depicts the Project area, including proposed interconnection transmission lines (gen-tie).

The Project would provide energy storage for California's electric markets and support the state's pursuit of an environmentally clean and reliable electrical system. The proposed Project has the potential to emit air pollutants that affect air quality. During Project construction, emissions are expected to occur as a result of engine exhaust from the off-road construction equipment and vehicles. These emissions would primarily consist of carbon monoxide (CO), nitrogen oxide (NO_2), particulate matter with aerodynamic diameter equal to or less than 10 micrometers (PM_{10}), particulate matter with aerodynamic diameter equal to or less than 2.5 micrometers ($PM_{2.5}$), sulfur dioxide (SO_2), and volatile organic compounds (VOC). Site preparation and disturbance would result in fugitive dust emissions. During Project operation, there would be one diesel emergency generator and one diesel fire pump installed at the facility. These sources would have exhaust emissions during their routine maintenance and testing, and during emergency use. In addition, the occasional vehicle trips needed for the facility's operation and maintenance (O&M) would also emit air pollutants.

Direct and indirect air quality effects from the emissions associated with the Project are further discussed in Sections 5.1.6 through 5.1.10.

5.1.2 Project Description

5.1.2.1 Project Location

The Project is in Alameda County, California, adjacent to the proposed Sand Hill Wind Repower Project (see Figure 1-1). The Project area is approximately 0.8 miles south of the Bethany Reservoir, 1.8 miles north of Altamont Pass Road, and 4.7 miles northwest of the city limits of Tracy (see Figure 1-4).

The Project area is within the boundary of San Francisco Bay Area Air Basin (SFBAAB). SFBAAB encompasses all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma Counties. The Project area is surrounded by open spaces, with sparsely scattered industrial facilities and residential units.

5.1.2.2 Project Equipment Specifications

The layout of the proposed facility is detailed in Section 2 and will include the following elements:

- Battery units, Tesla Megapack 2XL or similar
- Medium voltage transformer
- Emergency diesel fire water pump
- Emergency diesel generator
- Fire water tank
- O&M pad
- Onsite substation

A complete description of the Project equipment is presented in Section 2.

5.1.3 Existing Site Conditions

The Project is currently vacant. There are no current air pollution sources on the proposed site, and there are no facilities currently on the site that are permitted by the BAAD.

5.1.3.1 Geography and Topography

The Project is located in in Livermore Valley in the SFBAAB, which is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays that distort normal wind flow patterns. The Coast Ranges split, 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.

The Livermore Valley is a sheltered inland valley near the eastern border of SFBAAB. The western side of the valley is bordered by 1,000 to 1,500 foothills with two gaps connecting the valley to the central SFBAAB, the Hayward Pass and Niles Canyon. The eastern side of the valley also is bordered by 1,000 to 1,500 foothills with one major passage (the Altamont Pass) to the San Joaquin Valley and several secondary passages. The Black Hills and Mount Diablo lie to the north. A northwest to southeast channel connects the Diablo Valley to the Livermore Valley. The south side of the Livermore Valley is bordered by mountains approximately 3,000 to 3,500 feet high (BAAQMD 2017a).

5.1.3.2 Climate and Meteorology

The climate in the SFBAAB is dominated by the strength and location of a semipermanent, 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 a low air pollution potential (BAAQMD 2017a).

The SFBAAB has moderately wet winters and dry summers. Winter rains account for about 75% 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 2017a).

In Livermore Valley, during the summer months, when there is a strong inversion with a low ceiling, air movement is weak and pollutants become trapped and concentrated. Maximum summer temperatures in the Livermore Valley range from the high 80 degrees Fahrenheit (°F) to the low 90s °F, with extremes in the 100s °F. At other times in the summer, a strong Pacific high-pressure cell from the west coupled with hot inland temperatures causes a strong onshore pressure gradient that produces a strong afternoon wind. With a weak temperature inversion, air moves over the hills with ease, dispersing pollutants.

In the winter, with the exception of an occasional storm moving through the area, air movement is often dictated by local conditions. At night and early morning, especially under clear, calm, and cold conditions, gravity drives cold air downward. The cold air drains off the hills and moves into the gaps and passes. On the eastern side of the valley, the prevailing winds blow from north, northeast, and east out of the Altamont Pass. Winds are light during the late night and early morning hours. Winter daytime winds sometimes flow from the south through the Altamont Pass to the San Joaquin Valley. Average winter maximum temperatures range from the high 50s °F to the low 60s °F, while minimum temperatures are from the mid-to-high 30s °F, with extremes in the high teens and low 20s °F (BAAQMD 2017a).

5.1.4 Overview of Air Quality Standards and Greenhouse Gases

5.1.4.1 Air Quality Standards for Criteria Pollutants

In 1970, the U.S. Congress instructed the U.S. Environmental Protection Agency (EPA) to establish standards for air pollutants, which were of nationwide concern. This directive resulted from the concern of the potential impacts of air pollutants on the health and welfare of the public. The resulting Clean Air Act (CAA) set forth the National Ambient Air Quality Standards (NAAQS) to protect the health and welfare of the public. Two levels of NAAQS were promulgated—primary standards and secondary standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. To date, NAAQS have been established for the following six criteria pollutants: SO_2, CO, ozone, NO_2, PM_{10}/$PM_{2.5}$, and lead.

Criteria pollutants are those pollutants that have been demonstrated historically to be widespread and have a potential to cause adverse health effects. EPA developed comprehensive documents detailing the basis of, or criteria for, the standards that limit the ambient concentrations of these pollutants. The State of California has also established California Ambient Air Quality Standards (CAAQS) that further limit the allowable concentrations of certain pollutants. Review of the established air quality standards is undertaken by EPA and the State of California periodically. As a result of the periodic reviews, the standards have been updated and amended over the years following adoption.

Each federal or state standard has two basic elements: a numerical limit expressed as an allowable concentration, and an averaging time that specifies the period over which the concentration value is to be measured. Table 5.1-1 presents the current federal and state ambient air quality standards.

Table 5.1-1. State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS (Primary)	NAAQS (Secondary)
Ozone	1-hour	0.09 ppm (180 µg/m^3)	--	--
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3) (3-year average of annual 4th-highest daily maximum)	Same as Primary
CO	1-hour	20 ppm (23,000 mg/m^3)	35 ppm (40,000 mg/m^3) (Not to be exceeded more than once per year)	--
	8-hour	9.0 ppm (10,000 mg/m^3)	9 ppm (10,000 mg/m^3) (Not to be exceeded more than once per year)	--
NO_2	1-hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3) (3-year average of 98th percentile of 1-hour daily maximum)	--
	Annual average	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3) (annual mean)	Same as Primary
SO_2	1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3) (3-year average of annual 99th percentile daily maximum)	--
	3-hour	--	--	0.5 ppm (1,300 µg/m^3) a
	24-hour	0.04 ppm (105 µg/m^3)	--	--
	Annual average	--	--	--
PM_{10}	24-hour	50 µg/m^3	150 µg/m^3 (Not to be exceeded more than once per year on average over 3 years)	Same as Primary
	Annual arithmetic mean	20 µg/m^3	--	--
$PM_{2.5}$	24-hour	--	35 µg/m^3 (3-year average of annual 98th percentiles)	Same as Primary
	Annual arithmetic mean	12 µg/m^3	9 µg/m^3 (annual mean, 3-year average)	12 µg/m^3 (annual mean, 3-year average)
Lead	30-day average	1.5 µg/m^3	--	--
	Calendar quarter	--	1.5 µg/ m^3	Same as Primary
	3-month rolling average	--	0.15 µg/m^3 (not to be exceeded)	Same as Primary
Sulfates	24-hour	25 µg/m^3	--	--

Pollutant	Averaging Time	CAAQS	NAAQS (Primary)	NAAQS (Secondary)
Visibility Reducing Particles	8-hour	Extinction of 0.23 per kilometer	--	--
Hydrogen sulfide	1-hour	0.03 ppm (42 µg/m^3)	--	--
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	--	--

Source: California Air Resources Board (CARB) 2024; EPA 2025a

Notes:

-- = Not applicable and/or no standard

µg/m^3 = microgram(s) per cubic meter

ppm = part(s) per million

Brief descriptions of health effects for the main criteria pollutants are as follows:

- **Ozone**—Ozone is a reactive pollutant that is not emitted directly into the atmosphere, but rather is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving VOC and NO_x. VOC and NO_x are therefore known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of VOC and NO_x under the influence of wind and sunlight. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. In addition to causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.
- **Carbon Monoxide**—CO is a non-reactive pollutant that is a product of incomplete combustion. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses.
- **Particulate Matter (PM_{10} and $PM_{2.5}$)**—Both PM_{10} and $PM_{2.5}$ represent fractions of particulate matter, which can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, contribute to increases in local PM_{10} concentrations, while others, such as vehicular traffic, affect regional PM_{10} concentrations.

  Several studies that EPA has relied on have shown an association between exposure to particulate matter, both PM_{10} and $PM_{2.5}$, and respiratory ailments or cardiovascular disease. Other studies have related particulate matter to increases in asthma attacks. In general, these studies have shown that short-term and long-term exposure to particulate matter can cause acute and chronic health effects. $PM_{2.5}$, which can penetrate deep into the lungs, causes more serious respiratory ailments.
- **Nitrogen Dioxide and Sulfur Dioxide**—NO_2 and SO_2 are two gaseous compounds within a larger group of compounds, NO_x and sulfur oxides (SO_x), respectively, which are products of the combustion of fuel. NO_x and SO_x emission sources can elevate local NO_2 and SO_2 concentrations, and both are regional precursor compounds to particulate matter. As described above, NO_x is also an ozone precursor compound and can affect regional visibility. (NO_2 is the "whiskey brown-colored" gas readily visible

during periods of heavy air pollution.) Elevated concentrations of these compounds are associated with increased risk of acute and chronic respiratory disease.

SO_2 and NO_2 emissions can be oxidized in the atmosphere to eventually form sulfates and nitrates, which contribute to acid rain. Large power facilities with high emissions of these substances from the use of coal or oil are subject to emissions reductions under the Phase I Acid Rain Program of Title IV of the 1990 CAA Amendments. Power facilities with individual equipment capacity of 25 MW or greater that use natural gas or other fuels with low sulfur content are subject to the Phase II Acid Rain Program of Title IV. The Phase II program requires facilities to install continuous emissions monitoring systems (CEMS) in accordance with 40 Code of Federal Regulations (CFR) Part 75 and report annual emissions of SO_x and NO_x. The Acid Rain Program provisions do not apply to the Project as it will not use fossil fuels as the energy source for the PGF operations.

- **Lead**—Gasoline-powered automobile engines used to be the major source of airborne lead in urban areas. Excessive exposure to lead concentrations can result in gastrointestinal disturbances, anemia, and kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. The use of lead additives in motor vehicle fuel has been eliminated in California, and lead concentrations have declined substantially as a result.

Sections 5.1.9 and 5.1.10 provide an assessment of the Project compliance with the NAAQS and CAAQS.

5.1.4.2 Greenhouse Gases

In addition to the criteria pollutants, GHG emissions are of global concern. Although there are no ambient air quality standards for GHGs, they are regulated by the CARB and the EPA.

Common GHGs include the following pollutants:

- **Carbon Dioxide**—Carbon dioxide (CO_2) is a naturally occurring gas, as well as a byproduct of burning fossil fuels and biomass, land use changes, and other industrial processes. It is the principal anthropogenic GHG that affects the Earth's radiative balance.
- **Methane**—Methane (CH_4) is a GHG with a global warming potential (GWP) most recently estimated at 25 times that of CO_2.[1] CH_4 is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
- **Nitrous Oxide**—Nitrous oxide (N_2O) is a GHG with a GWP most recently estimated at 298 times that of CO_2. Major sources of N_2O include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
- **Hydrofluorocarbons**—Hydrofluorocarbons (HFCs) are compounds containing only hydrogen, fluorine, chlorine, and carbon. HFCs have been introduced as a replacement for the chlorofluorocarbons identified as ozone-depleting substances.
- **Perfluorocarbons**—Perfluorocarbons (PFCs) are compounds containing only fluorine and carbon. Similar to HFCs, PFCs have been introduced as a replacement for chlorofluorocarbons. PFCs are also used in manufacturing and are emitted as by-products of industrial processes. PFCs are powerful GHGs.
- **Sulfur Hexafluoride**—Sulfur hexafluoride (SF_6) is a colorless gas soluble in alcohol and ether, and is slightly soluble in water. It is a very powerful GHG used primarily in electrical transmission and distribution systems, as well as dielectrics in electronics.

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors, natural processes, and human activities that change the composition of the atmosphere and alter the

[1] GWP is a measure of how much a given mass of GHG is estimated to contribute to global warming and is a relative scale that compares the mass of one GHG to that same mass of CO_2.

surface and features of the land. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth.

Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (that is, fuels containing carbon) in conjunction with other human activities, appears to be closely associated with global warming. According to the Intergovernmental Panel on Climate Change's (IPCC's) Fifth Assessment (IPCC 2014), it is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations.

The Project impact assessment for GHG is focused on the potential impacts from direct GHG emissions from operating the combustion equipment such as the emergency generator and fire pump, the leakage of certain HFCs and PFCs from refrigerants, leakage of SF_6 from breakers, and the indirect GHG emissions associated with energy consumptions of the facility operation. GHG emissions are presented as carbon dioxide equivalent (CO_2e).

5.1.5 Existing Air Quality

The CAAQS and NAAQS, as previously described, establish the level for which air pollution is considered detrimental to public health or welfare. If a pollutant concentration in an area is lower than the established standard, the area is classified as being in "attainment" for that pollutant. If the pollutant concentration meets or exceeds the standard (depending on the specific standard for the individual pollutants), the area is classified as a "nonattainment" area. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified." Table 5.1-2 presents the attainment/nonattainment status of the Project area with respect to the CAAQS and NAAQS.

Table 5.1-2. Alameda County Attainment Status

Pollutant	Averaging Time	Federal Status	State Status
Ozone	1-hour	No NAAQS	Nonattainment
	8-hour	Nonattainment (Marginal)	Nonattainment
CO	All	Unclassified/Attainment	Unclassified/Attainment
NO_2	All	Attainment	Unclassified/Attainment
SO_2	All	Unclassified/Attainment	Unclassified/Attainment
PM_{10}	All	Unclassified/Attainment	Nonattainment
$PM_{2.5}$	All	Nonattainment (Moderate)	Nonattainment
Lead	All	Unclassified/Attainment	Unclassified/Attainment
Sulfates	24-hour	No NAAQS	Unclassified/Attainment
H_2S	1-hour	No NAAQS	Unclassified/Attainment
Vinyl Chloride	24-hour	No NAAQS	Unclassified/Attainment
Visibility Reducing Particles	8-hour	No NAAQS	Unclassified/Attainment

Sources EPA 2025b, CARB 2025a

Air monitoring data near the Project has been reviewed and summarized to present the existing air quality of the area. The monitoring stations closest to the Project are:

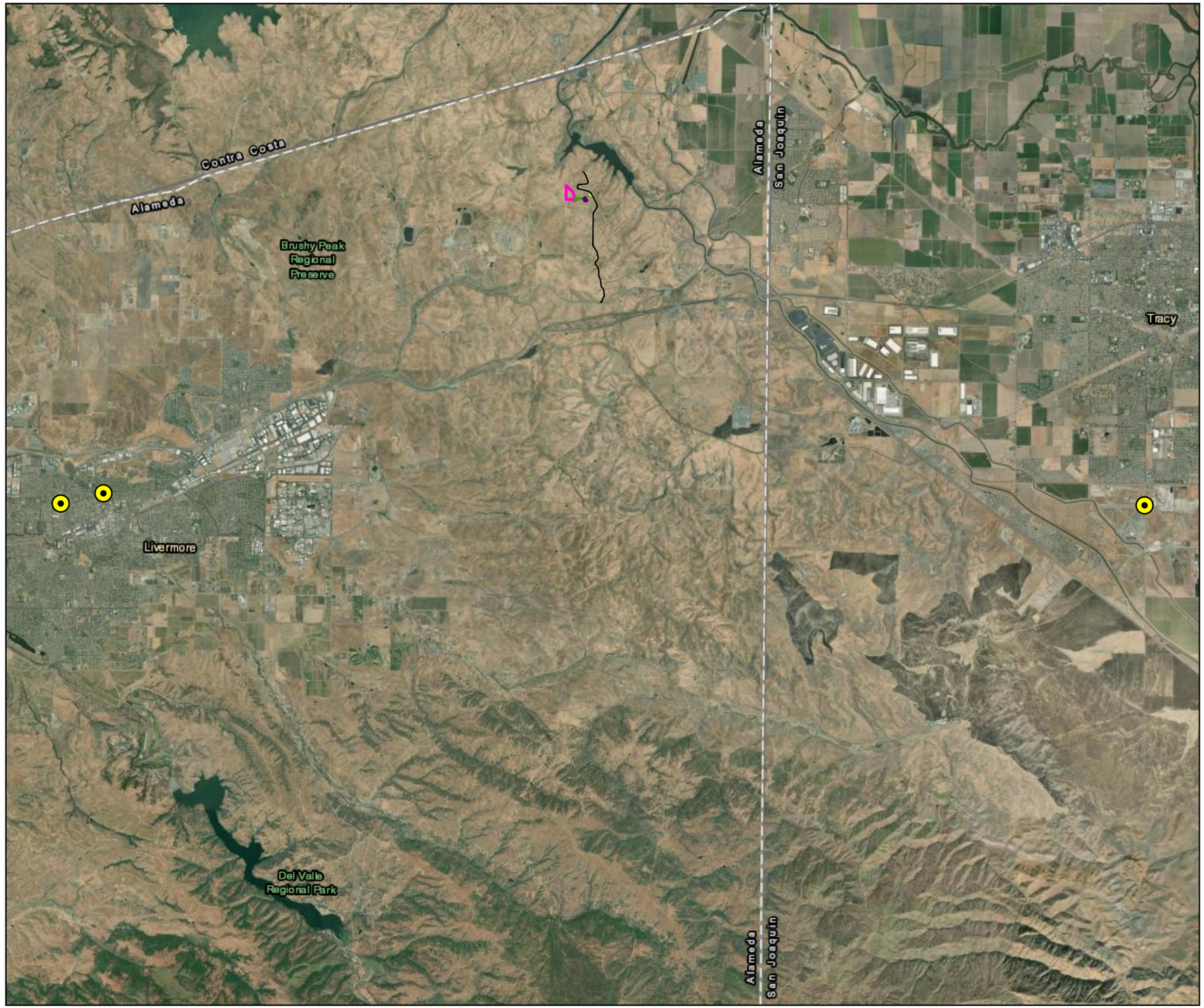
- Livermore Portola Station at 2451 Portola Avenue, Livermore (AQS ID 06-001-0016), 9.7 miles southwest of the Project (measures ozone, NO_2)
- Livermore Rincon Station at 793 Rincon Avenue, Livermore (AQS ID: 06-001-0007),10.5 miles southwest of the Project (measures ozone, $PM_{2.5}$, NO_2)
- Tracy Airport Station at 5749 S. Tracy Blvd., Tracy (AQS ID 06-077-3005), 11.3 miles southeast of the Project (measures ozone, $PM_{2.5}$, PM_{10}, NO_2)

Figure 5.1-1 shows the locations of these monitoring stations.

The following two stations were used for CO and SO_2 concentrations because the three stations above do not measure these two pollutants:

- Owens Ct Station at Owens Ct., Pleasanton (AQS ID 06-001-0015), 16.1 miles southwest of the Project (measures CO)
- Bethel Island Road Station at 5551 Bethel Island Rd, Bethel Island (AQS ID 06-013-1002), 16.3 miles north of the Project (measures CO, SO_2)

Table 5.1-3 provides a summary of monitored ambient air quality concentrations from 2021 to 2023. When monitoring data are available from more than one station, the worst-case concentrations were used in the summary. The monitoring data summarized in Table 5.1-3 are used as a reasonable and conservative representation of background air quality for the Project area because these monitoring stations are located in towns with nearby industrial and commercial areas that might have higher pollutant concentrations compared to the Project area, which is surrounded by open spaces.



Legend

- Air Monitoring Station
- Proposed 230-kV Gen-Tie
- Proposed Access Road Widening Area
- Proposed Improvements to Existing Access Road
- Proposed Alternate Substation Area
- Proposed Viracocha BESS Equipment Yard
- Ralph Substation
- Wind Farm Road (No Improvements)

Source:
1) ESRI Aerial Images

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Miles

Figure 5.1-1
Air Monitoring Station Locations
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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Table 5.1-3. Measured Ambient Air Quality Concentrations in 2021-2023

Pollutant	Units	Averaging Time	Basis	Site	2021	2022	2023
Ozone	ppm	1-hour	CAAQS-1st High	Livermore Portola, Livermore Rincon, Tracy	0.11	0.10	0.09
		8-hour	CAAQS-1st High	Livermore Portola, Livermore Rincon, Tracy	0.09	0.08	0.08
			NAAQS-4th High	Livermore Portola, Livermore Rincon, Tracy	0.07	0.07	0.07
NO_2	ppb	1-hour	CAAQS-1st High	Livermore Portola, Livermore Rincon, Tracy	36.00	42.00	35.00
			NAAQS-98th percentile	Livermore Portola, Livermore Rincon, Tracy	32.70	34.10	30.30
		Annual	CAAQS/NAAQS-AAM	Livermore Portola, Livermore Rincon, Tracy	6.00	8.00	6.00
CO	ppm	1-hour	CAAQS/NAAQS-2nd High	Owens Court, Bethel Island Road	1.70	1.20	14.5
		8-hour	CAAQS/NAAQS-2nd High	Owens Court, Bethel Island Road	3.60	0.90	1.00
SO_2	ppb	1-hour	CAAQS/NAAQS-1st High	Bethel Island Road	9.00	4.50	3.60
		24-hour	CAAQS/NAAQS-1st High	Bethel Island Road	3.80	2.40	2.70
		Annual	CAAQS/NAAQS-AAM	Bethel Island Road	1.14	1.18	1.35
PM_{10}	$\mu g/m^3$	24-hour	CAAQS-1st High	Tracy	173.50	74.90	71.00
			NAAQS-2nd High	Tracy	149.20	75.00	70.20
		Annual	CAAQS-AAM	Tracy	--	23.00	19.90
$PM_{2.5}$	$\mu g/m^3$	24-hour	NAAQS-98th percentile	Livermore Rincon, Tracy	23.10	20.10	22.30
		Annual	CAAQS/NAAQS-AAM	Livermore Rincon, Tracy	7.90/ 8.00	7.50/ 4.60	6.40/ 4.50

Sources: CARB 2025b and EPA 2025c

Notes:

AAM = annual arithmetic mean

ppb = part(s) per billion

-- = data not available

5.1.6 Environmental Analysis – Emissions Evaluation

5.1.6.1 Project Operation

Criteria pollutants, GHG, and TAC emissions from the Project are described in the following sections, while a more detailed discussion of TACs is provided in Section 5.9. Backup data for operational emission calculations are provided in Appendix 5.1A.

Emission Estimates

Air emissions will occur through the operation of one diesel-fired emergency generator and one diesel-fired fire pump engine, and O&M equipment and vehicles, which may travel onsite and offsite.

Operation of the proposed equipment will result in emissions of criteria pollutants, GHGs, and TACs.[2] Criteria pollutant emissions will consist primarily of NO_x, CO, VOCs, SO_x, PM_{10}, and $PM_{2.5}$. GHG emissions may include CO_2, CH_4, and N_2O from combustion, SF_6 from circuit breakers, and HFCs or PFCs from refrigerant use. All GHG emissions are presented as CO_2e emissions based on their GWP. TACs will consist of a combination of toxic gases and toxic particulate matter species. For this analysis, diesel particulate matter (DPM) is used as a surrogate to represent the TACs from diesel combustion emissions. Table 5.1-4 lists the pollutants that may potentially be emitted during Project operations.

Table 5.1-4. Potentially Emitted Pollutants

Criteria Pollutants	GHGs	TACs
NOx	CO_2e including:	DPM (used as surrogate for diesel combustion emissions of TACs)
CO	CO_2	
VOC	CH_4	
SO_x	N_2O	
$PM_{10}/PM_{2.5}$	SF_6	
	HFCs and PFCs	

The facility would be unstaffed during operation, with minimal need for worker or delivery truck trips related to O&M activities. Criteria pollutants and GHG emissions from Project operations were estimated using CalEEMod (CAPCOA 2025). Based on available Project information, the operational year 2027 was used for estimating emissions for the following sources in CalEEMod:

- Mobile sources: During operation, the facility will be monitored remotely, and regular O&M will be conducted approximately monthly by one or two service personnel and one service vehicle. Heavy-duty trucks are not expected for routine facility operation or maintenance. Emissions from mobile source operation are included in CalEEMod but would be expected to be negligible.
- Area sources: Because this is a BESS facility, no hearths, consumer products, architectural coating, or landscape equipment usage would be needed for facility operation.
- Energy use: Operation of the facility would rely on electricity from the power grid for both charging the BESS and operating the facility's safety/security systems. BESS is not a facility type included in CalEEMod. Indirect GHG emissions associated with energy consumption at the facility will be estimated based on the amount of energy consumption and the GHG emission factors for Pacific Gas and Electric Company (PG&E) grids.
- Water and wastewater: The facility would not have operations or emissions associated with water and wastewater.

[2] Note that the EPA designates a subset of TACs as hazardous air pollutants (HAPs).

- Solid waste: The facility would not have operations or emissions associated with solid waste.
- Stationary sources: The facility would have one diesel emergency generator and one diesel fire pump. Emissions from these two sources were estimated based on the following assumptions and methodologies:
  - The diesel emergency generator and the fire pump would meet Tier 4 emission standards.
  - Criteria pollutant emissions from the diesel fire pump engine were using Tier 4-emission. For criteria pollutants and GHG that do not have Tier 4 standards, default emission factors for the engines with corresponding horsepower rating from CalEEMod 2022.1 were used.
  - DPM emissions were assumed to be the same as diesel PM_{10} exhaust emissions and were used as a surrogate for diesel emissions from the engine. The engine is expected to operate up to 1 hour per day and 50 hours per year for maintenance and testing.

In addition to the emission sources included in the CalEEMod modeling, the following two sources associated with the BESS operation were evaluated for potential GHG emissions:

- Refrigerant leaks: To be Determined (Pending for data)
- SF_6: SF_6 is a GHG with high GWP and often used in circuit breakers. SF_6 emissions were estimated based on the number of circuit breakers, the SF_6 capacity of each breaker, and a leakage rate of SF_6.

Because the equipment and vehicles that will be used during Project operation are mainly diesel powered, DPM was used as a surrogate for the TAC emissions from the Project operation. Section 5.9 provides a detailed discussion and quantification of TAC emissions from Project operation.

Tables 5.1-5 and 5.1-6 present a summary of air pollutant emissions estimated for the facility operation.

Table 5.1-5. Summary – Project Operation Daily Emissions (lb/day)

Pollutant	Daily Emissions (lb/day) [a]		
	Emergency Generator [b]	Fire Pump [c]	Other [d]
NO_x	1.477	0.165	--
CO	7.681	1.433	--
VOC	0.414	0.077	--
PM_{10}	0.065	0.008	--
$PM_{2.5}$	0.065	0.008	--
SO_x	0.015	0.003	--
HAPs (DPM) [d]	0.065	0.008	--
CO_2e	1,546.07	288.44	193.58[e]

Notes:

<= less than

lb/day = pounds per day

[a] Operation emissions for a single day measured in pounds

[b] One (1) Tier 4-rated diesel emergency generator

[c] One (1) Tier 3-rated diesel fire pump

[d] HAPs are assumed to be equal to DPM (PM10 exhaust emissions from diesel combustion). DPM is considered a surrogate for HAPs.

[e] GHG emissions associated with SF6/CFC/PFC and energy use will be provided when available.

Table 5.1-6. Summary – Project Operation Annual Emissions

Pollutant	Annual Emissions (tpy) [a]		
	Emergency Generator [b]	Fire Pump [c]	Other [d]
NO_x	0.037	0.004	--
CO	0.192	0.036	--
VOC	0.010	0.002	--
PM_{10}	0.002	< 0.001	--
$PM_{2.5}$	0.002	< 0.001	--
SO_x	< 0.001	< 0.001	--
HAP (DPM) [d]	0.002	< 0.001	--
CO_2e[e]	38.652	7.211	38.942

Notes:

<= less than

tpy = tons per year

[a] Operation emissions for a single year measured in tons

[b] One (1) Tier 4 diesel emergency generator

[c] One (1) Tier 4 diesel fire pump

[d] HAPs are assumed to be equal to DPM (PM_{10} exhaust emissions from diesel combustion). DPM is considered a surrogate for HAPs.

[e] GHG emissions associated with SF6/CFC/PFC and energy use will be provided when available.

Significance of Operation Emissions

Table 5.1-7 presents the Project emissions for comparison with BAAD's air quality significance thresholds for operation, as in the BAAD California Environmental Quality Act (CEQA) guidance (BAAQMD 2022).

Table 5.1-7. Project Emissions and CEQA Significance Thresholds for Operation

Pollutant	Project Average Daily Emissions [a]	BAAD Operational Thresholds	Project Annual Operational Emissions [a]	BAAD Operational Thresholds
	lb/day	lb/day	tpy	tpy
NO_x	1.642	54	0.041	10
CO	9.114	--	0.228	--
VOC	0.491	54	0.012	10
PM_{10}	0.073	82	0.002	15
$PM_{2.5}$	0.073	54	0.002	10
SO_x	0.018	--	< 0.001	--
CO_2e [b]	464.688	--	84.806	--

Source: BAAQMD 2022.

Note:

< = less than

-- = Not applicable and/or no standard

[a] Project operational emissions potential to emit for one (1) Tier 4 emergency generator and one (1) Tier 3 fire pump.

[b] Does not include refrigerant and energy GHG which will be provided when available

As shown, operational emissions from Project activities are not expected to exceed the daily and annual significance thresholds for criteria pollutants. Therefore, the Project would result in less-than-significant impacts with respect to operational emissions of criteria pollutants.

The GHG emissions from the Project operations (fuel combustion) would be 84.80 tpy (76.94 metric ton [MT]) CO_2e per year. BAAD has not adopted quantitative GHG emission thresholds for determining significance of GHG emissions. According to the BAAD CEQA Guidelines, GHG impacts from a project would be less than significant if the project is consistent with a local GHG reduction strategy that meets the criteria under the CEQA Guidelines Section 15183.5(b).

The primary purpose of the Project is to assist the State of California in meeting the goal of all electricity in California to come from renewable and zero carbon resources by 2045 as required under Senate Bill (SB) 100 (2018). The Project displaces the need for additional fossil fuel-based generating stations to serve peak demand periods when renewable sources may be inadequate or unavailable. As a BESS project designed to optimize the capture, storage, distribution, and use of renewable energy, the Project would support California's renewable energy program goals under the Renewable Portfolio Standard and the CARB Assembly Bill (AB) 32 Scoping Plan. Through more efficient energy storage, the Project would support the electricity generation sector in achieving its AB 32 and SB 32 statewide GHG emission-reduction goals. The Project would also be consistent with the BAAD 2017 Clean Air Plan Energy Control Measure EN1, Decarbonize Electricity Production, which supports local renewable energy programs and strives to maximize the amount of renewable energy produced and used for electricity in the Bay Area (BAAQMD 2017b).

In 2014, Alameda County adopted the Unincorporated Areas Community Climate Action Plan (CCAP) (Alameda County 2014). The CCAP describes a series of 37 local programs and policy measures to reduce GHG emissions in unincorporated Alameda County by more than15% below the inventoried 2005 levels by 2020. The CCAP provides a blueprint for GHG emission-reduction measures and policies related to transportation, land use, building energy, water, waste, and green infrastructure. Full implementation of the strategies in the CCAP would allow the County to reduce GHG emissions to 80% below 1990 levels by 2050 (Alameda County 2014). The Project would support achieving the County's GHG reduction goals in the CCAP, primarily related to the Building Energy Action Area, by expanding renewable energy availability for use within the unincorporated county, supporting the strategies and public/private partnerships that are aimed at developing a comprehensive renewable energy program, and increasing the amount of renewable energy available in the electricity grid's generation portfolio. As a result, the Project would be consistent with the local GHG reduction strategy that meets criteria in CEQA Guidelines Section 15183.5(b). The Project's effect on GHG would not be cumulatively considerable because it is consistent with the adopted Alameda County CCAP.

In summary, the Project would be consistent with state and regional GHG reduction plans, including the Alameda County CCAP and the BAAD 2017 Clean Air Plan. Therefore, the GHG impact from the Project would be less than significant.

5.1.6.2 Project Construction

The construction phase of the Project is expected to take approximately 14 months starting in 2026, and an additional 7 months in 2056 for decommissioning. Construction equipment may operate up to 10 hours per day, for a 6 days-per-week work week. Several areas in the vicinity of the Project will be available for equipment and materials laydown, storage, construction equipment parking, small fabrication areas, and office trailers. Compliance with the provisions of the following permits and plans will generally result in minimal site emissions:

- Grading permit
- Construction site provisions of the site's Storm Water Pollution Prevention Plan (SWPPP)
- BAAD-issued Authority to Construct (ATC), which will require compliance with the provisions of all applicable fugitive dust rules that pertain to the Project's construction phase

Emission Estimates

Project construction would result in exhaust emissions from fuel combustion in off-road construction equipment and vehicles and fugitive dust emissions from earthmoving activities and vehicle travel on paved and unpaved roads. Construction emissions were estimated using CalEEMod Version 2022.1 (CAPCOA 2025). Construction emissions modeled include the following sources:

- Exhaust emissions of ROG, NO_x, CO, SO_2, PM_{10}, $PM_{2.5}$, and GHGs from off-road construction equipment
- Exhaust emissions of ROG, NO_x, CO, SO_2, PM_{10}, $PM_{2.5}$, and GHGs from on-road vehicle trips, including worker commutes, vendor trips, and haul truck trips
- Fugitive dust emissions of PM_{10} and $PM_{2.5}$ from onsite earthmoving activities and offsite vehicle travel on paved and unpaved roads

The construction of the Project would take approximately 14 months starting in 2026. In addition, construction activities would occur at the end of the 30-year life span of the Project during decommissioning and closure. Project-specific information on the construction schedule, equipment types, and daily usage rates for each activity during the Project construction was used in the CalEEMod modeling based on the current Project design. Default settings in CalEEMod were used when Project-specific information was not available. Appendix 5.1A provides details of the assumptions and emission calculations including the construction activities and equipment and vehicle usage rates used in the CalEEMod modeling. CalEEMod output files are in Appendix 5.1B.

The average daily and annual criteria pollutant emissions from the construction activities are presented in Table 5.1-8.

Table 5.1-8. Project Construction Criteria Pollutant Emissions

Construction Emissions	NO_X	CO	VOC	SO_2	PM_{10} (Exhaust)	PM_{10} (Fugitive Dust)	$PM_{2.5}$ (Exhaust)	$PM_{2.5}$ (Fugitive Dust)
Average Daily Emissions (lbs/day)	10.3	10.0	0.95	0.03	0.34	277.72	0.30	28.20
Annual Emissions [a] (tpy)	1.88	1.83	0.17	0.01	0.06	50.7	0.06	5.15

Note:

< = less than

[a] Maximum annual emissions during years 2026, 2027, and 2056

GHG emissions from Project construction were calculated using the same methodology used for criteria pollutants. The average daily and annual GHG emissions from the combined onsite and offsite construction activities are presented in Table 5.1-9. The detailed emission calculations for construction are provided in Appendix 5.1A. There is no proposed construction-related climate impact threshold at this time. According to BAAD CEQA guidelines, GHG emissions from construction represent a very small portion of a project's lifetime GHG emissions.

Table 5.1-9. Project Construction Greenhouse Gas Emissions

Construction Emissions	CO_2	CH_4	N_2O	R [b]	CO_2e
Average Daily Emissions (lb/day)	3,743	0.197	0.343	2.476	3,852
Maximum Annual Emissions (MT/year) [a]	620	0.033	0.057	0.410	638

Notes:
[a] Maximum value of the annual emissions during years 2026, 2027, and 2056.
[b] Refrigerants

Construction-related emissions of TACs will result from the Project's mobile source combustion activities during the construction phase. See Section 5.9 for a detailed discussion and quantification of TAC emissions from Project construction.

Mitigation Measures for Construction

Construction activities have the potential for air quality impacts from fugitive dust and other emissions. The Applicant will comply with fugitive dust mitigation measures consistent with BAAD Regulation 6. The Project would implement the best management practices (BMPs) recommended by BAAD in the CEQA guidance to minimize and reduce fugitive dust emissions (BAAQMD 2022). BMPs listed as Basic Construction Mitigation Measures in Table 5-2 in BAAD's CEQA Guidelines (BAAQMD 2022) would be implemented during the construction phase. These BMPs include the following:

- All exposed surfaces (for example, parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day, as needed. 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. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- All trucks and equipment, including their tires, shall be washed off prior to leaving the Project.
- Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a 6- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.
- Publicly visible signs shall be posted with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

In addition, the Applicant would implement measures to reduce vehicle and equipment exhaust emissions:

- Maintain equipment according to manufacturers' specifications.
- Individual truck idling in excess of five consecutive minutes will be prohibited, or what is allowed under Title 13 of the California Code of Regulations Section 2485 (CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling).
- Use alternative fueled or catalyst equipped diesel construction equipment, including all off-road and portable diesel-powered equipment to the extent feasible.
- Limit, to the extent feasible, the hours of operation of heavy-duty equipment and/or the amount of equipment in use.
- Replace fossil fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).

Additional mitigation measures are available in BAAD CEQA guidelines for construction as discretionary or enhanced measures and may be implemented at the request of the California Energy Commission (CEC) or BAAD.

Significance of Construction Emissions

Table 5.1-10 presents the BAAD air quality significance thresholds for construction, as well as a comparison to the Project's construction emissions.

Table 5.1-10. BAAD Construction CEQA Significance Thresholds

Pollutant	Average Daily Project Construction Emissions (lb/day)	Construction Thresholds (lb/day)
NO_x	10.3	54
CO	10.0	--
VOC	0.95	54
SO_x	0.03	--
PM_{10} (Exhaust Emissions)	0.34	82
PM_{10} (Fugitive Dust Emissions)	277.72	BMP
$PM_{2.5}$ (Exhaust Emissions)	0.30	54
$PM_{2.5}$ (Fugitive Dust Emissions)	28.20	BMP
CO_2e	3,852	--

Source: BAAQMD 2022

Notes:

< = less than

-- = Not applicable and/or no standard

As shown in Table 5.1-10, construction emissions from all onsite and offsite Project activities are not expected to exceed the significance thresholds. Additionally, construction emissions from the Project would last for only 14 months, and the Applicant would implement BMPs to minimize construction emissions. The Project would have a less-than-significant impact from its emissions during construction.

5.1.7 Regulatory Items Affecting New Source Review

Stationary sources at the proposed facility would be subject to BAAD's new source review requirements. The analysis under new source review was prepared pursuant to BAAD Regulation 2, Permits for the stationary sources. The analysis includes discussions of stationary source emissions calculations, control technology assessments, and regulatory review. It also includes impact evaluations for criteria pollutants and TACs.

The stationary sources that would release criteria pollutants and TACs emissions during operation would be a new diesel emergency generator and a diesel fire pump engine. This diesel-fired equipment would only be used during emergencies and routine maintenance and testing. There are no other stationary sources in use at the BESS facility during operation. The proposed engines for the emergency generator and the fire pump would meet the BAAD BACT requirements, as further discussed in Section 5.1.9.

Daily and annual Potential to Emit (PTE) of the diesel emergency generator and fire pump engine are summarized in Table 5.1-11. As shown in the table, Project operation is not expected to result in emissions that will exceed major stationary source thresholds, nor is the facility expected to have emissions that would exceed BAAD Regulation 6 Rule 2 offset threshold values. Project operation is not expected to trigger the Prevention of Significant Deterioration (PSD) permitting requirements outlined in CFR, Title 40, Section 51.166(b)(1)(i)(b) because facility-wide emissions will not equal or exceed 250 tpy for any criteria pollutant.

Table 5.1-11. Facility Operation PTE Summary (Stationary Sources)

Pollutant	Facility Operation PTE [a]		BAAD Rule 2-6 Major Facility Thresholds	BAAD Rule 2-2 Offset Thresholds	EPA Major PSD Source Thresholds [b]	Title V Thresholds
	(tpy)	(lbs/day)	(tpy)	(tpy)	(tpy)	(tpy)
NO_x	0.04	1.64	100	10	250	100
CO	0.23	9.11	100	NA	250	100
VOC	0.01	0.49	100	10	250	100
SO_x	< 0.01	0.02	100	100	250	100
PM_{10}	< 0.01	0.07	100	100	250	70
$PM_{2.5}$	< 0.01	0.07	100	100	250	100
CO_2e	45.86	1,835	--	--	75,000	--

[a] Emissions represent operation of the diesel emergency generator and fire pump engine. The emissions do not include O&M activities, which are not subject to permitting.

[b] PSD major source review would be triggered for criteria pollutant emissions greater than 250 tpy. PSD review is not triggered solely based on GHG emissions. If the Project triggered PSD for any non-GHG pollutant, then PSD would be triggered if the CO_2e emissions were equal or greater than 75,000 tpy.

Because of the minimal emissions associated with the diesel emergency generator and fire pump engine, Project operation is not expected to cause increase of air pollutants concentrations that would violate the CAAQS or NAAQS. An air quality analysis was conducted to demonstrate that impacts from NO_x, CO, SO_2, PM_{10}, and $PM_{2.5}$ will comply with the CAAQS and NAAQS for the applicable averaging periods. Section 5.1.9 provides a detailed discussion of the air quality modeling.

Impacts from nearby sources (cumulative sources located within 6 miles of the Project with emissions greater than 5 tpy) will be assessed for criteria pollutants under separate cover, if needed, following consultation with the BAAD and CEC and completion of the CEC's data adequacy review.

A regulatory compliance analysis is presented in Section 5.1.11, which details the applicable BAAD regulations that directly affect the Project's permitting application and review process for the stationary sources. The applicable BAAD regulations related to new source review for stationary sources are:

- BAAD Rule 2-2-301 requires that an authority to construct and/or permit to operate for a new source shall require BACT to control emissions if the source will have the potential to emit in an amount of 10.0 or more pounds on any day. The proposed diesel emergency generator and the diesel fire pump would meet BACT requirements, as described in Section 5.1.8.
- BAAD Rule 2-2-302 and 303 requires emission offset, if triggered, prior to the issuance of the BAAD Authority to Construct. The Project is not expected to trigger the offset requirements, as shown in Table 5.1-11.
- BAAD Rue 2-2-308 states that the District shall not issue an authority to construct for a new or modified source that will result in a significant net increase in emissions of any pollutant for which a NAAQS has been established unless it is determined that such increase will not cause or contribute to an exceedance of any NAAQS for that pollutant. According to BAAD Rule 2-2-227.2, for determining whether an increase in emissions is "significant" for purposes of the NAAQS Protection Requirement in Rule 2-2-308 NAAQS Protection Requirement and the public notice requirement in Section 2-2-404, the increase is significant if it exceeds 100 tpy for CO; 40 tpy for NOx, VOC, and SO_2; 25 tons/year for PM_{10}; and 15 tpy for $PM_{2.5}$. As shown in Table 5.1-11, the Project would not have emissions exceeding these thresholds. In addition, the air quality modeling analysis of the proposed Project demonstrates that the stationary source operation emissions from the emergency generator and the fire pump would

not cause violations or worsen existing violations to the CAAQS and NAAQS, as further discussed in Sections 5.1.9 and 5.1.10.

BAAD Rule 2-5 requires review of TAC emissions and evaluation of health risks if TAC emissions from a Project exceed the trigger level defined in the rule. Discussion of compliance with BAAD Rule 2-5 is presented in Section 5.9, Public Health.

5.1.8 Best Available Control Technology Evaluation

BAAD Rule 2-2-301 requires that an authority to construct and/or permit to operate for a new or modified source shall require BACT if the source will have the potential to emit that pollutant in an amount of 10 or more pounds on any day.

5.1.8.1 BACT for Emergency Generator

The proposed diesel emergency generator would have a 1,340 horsepower (hp) engine that meets the Tier 4 emission standards. According to BAAD BACT/TBACT Workbook (BAAQMD 2025), for Compression Ignition Stationary Emergency engines with greater or equal to 1,000 bhp, applicable BACT is to have emissions equivalent to Tier 4 standards for VOC, NOx, PM, and CO. BACT for SO_2 is to use diesel with sulfur content not to exceed 15 ppm. Because the proposed diesel emergency generator will be equipped with a Tier 4 engine, it satisfies the BAAD BACT requirements for VOC, NOx, PM, and CO. The Project will only use diesel with ultra-low sulfur content not exceeding 15 ppm. Therefore, the emergency generator meets the BAAD BACT requirements.

5.1.8.2 BACT for Fire Pump Engine

The proposed diesel fire pump would be equipped with a Tier 4 engine. The BAAD BACT guideline for non-direct drive fire pump engine less than 1,000 hp is to meet Tier 4 emission standards for VOC, NOx, PM, and CO. BACT for SO_2 is to use diesel with sulfur content not to exceed 15 ppm (BAAQMD 2025). Because the proposed diesel fire pump will be equipped with a Tier 4 engine, it satisfies the BAAD BACT requirements for VOC, NOx, PM, and CO. The engine will only use diesel fuel with ultra-low sulfur content no greater than 15 ppm. Therefore, the proposed engine meets the BAAD BACT requirements.

5.1.9 Environmental Analysis – Air Quality Impact Analysis Methodology

An ambient air quality impact analysis was conducted to compare ground-level impacts resulting from the Project's operation emissions with established federal and state ambient air quality standards. The analysis evaluates the impacts from the Project operational emissions due to the onsite emergency generator and the fire pump engine.

Construction emissions from the Project would be temporary. The areas surrounding the construction sites are open spaces with sparse worker and residential receptors within a 3-kilometer radius from the site. As demonstrated in Table 5.1-10, construction emissions of criteria pollutants would be below BAAQMD thresholds and are not expected to cause significant adverse impacts to air quality during construction. Therefore, the short-term construction emissions would not be anticipated to cause violations to the ambient air quality standards. Quantitative air dispersion modeling was conducted for Project operation only.

5.1.9.1 Dispersion Model Selection and Options

Model Selection

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) (Version 24142) was used for the ambient air quality impact analysis, as recommended in the EPA's Appendix W, *Guideline on Air Quality Models* (89 FR 95034). AERMOD is a steady-state Gaussian plume model that simulates air dispersion based on planetary boundary layer turbulence structure and scaling

concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. This model is recommended for short-range (less than 50 kilometers) dispersion from the source.

AERMOD incorporates the plume rise model enhancement (PRIME) algorithm for modeling building downwash and is designed to accept input data prepared by two specific preprocessor programs, AERMOD meteorological data processor (AERMET) and AERMOD terrain processor (AERMAP). AERMOD modeling for the Project was run with the following technical options:

- Direction-specific building downwash
- Regulatory default options unless otherwise specified herein
- Rural dispersion characteristics
- Actual receptor elevations and hill height scales obtained from AERMAP (Version 24142)

Default model options for temperature gradients, wind profile exponents, and calm processing, which includes final plume rise, stack-tip downwash, and elevated receptor (complex terrain) heights option were used in this modeling analysis. The details of other inputs required for dispersion modeling with AERMOD are described in the following sections.

Meteorological Data

Five years of AERMET-processed meteorological data were obtained from BAAD's AERMOD Meteorological Files webpage[3] for the Livermore Municipal Airport station (KLVK, UA ID: 23230, SF ID: 23285). The 5 years of data, spanning from 2013 to 2017, were processed with AERMET Version 18081. The data set was selected based on completeness, similar surrounding land use as the plant site and proximity to the facility. The location of the meteorological station is provided on Figure 5.1-2. Wind speeds and directions for this data set are presented in the wind rose in Figure 5.1-3. The average wind speed for the 5-year period was 3.09 meters per second (m/s).

Receptor Grid Selection and Coverage

The selection of receptors in AERMOD was as follows:

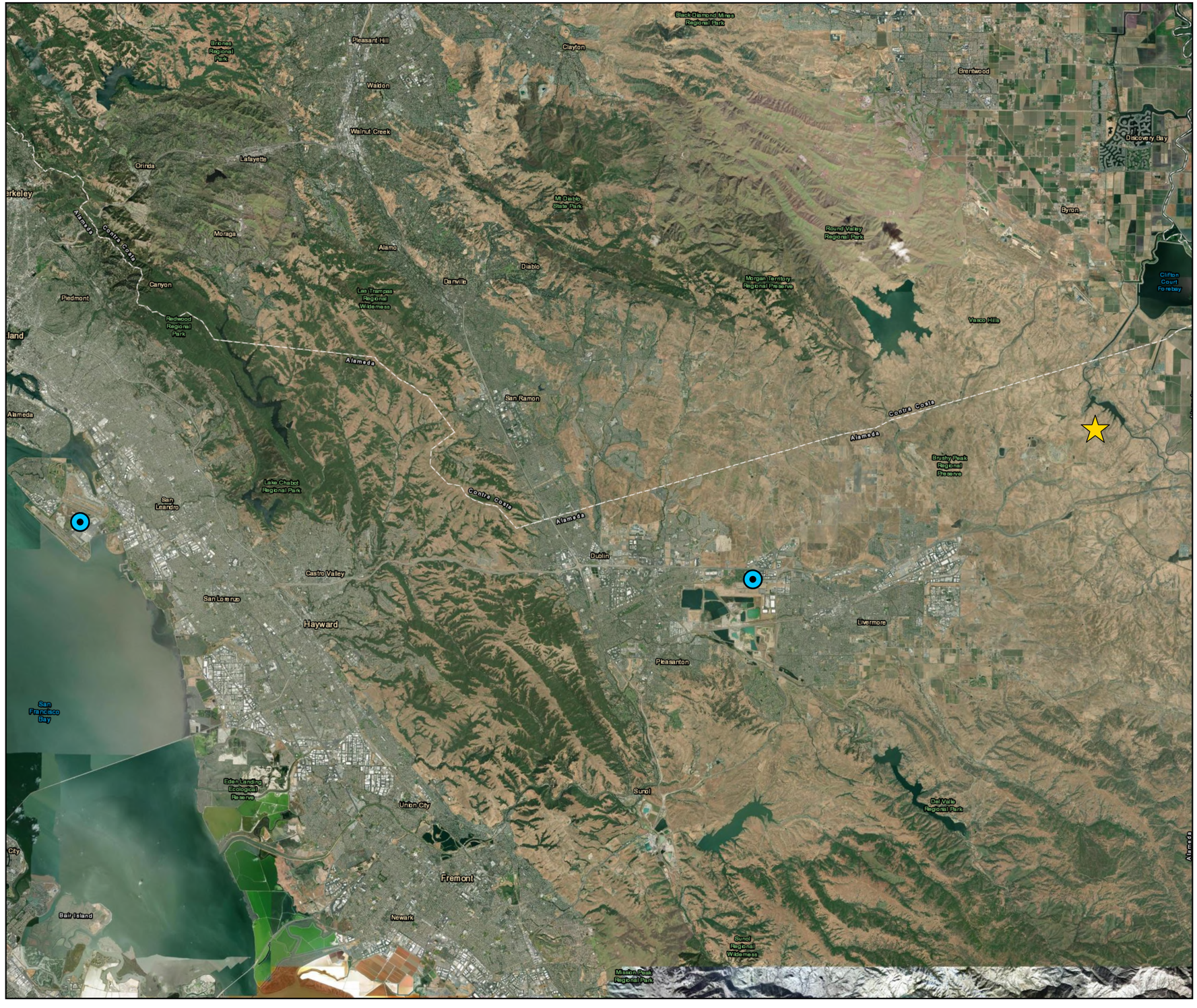
- Discrete receptors every 20 meters (m) around the facility fence line
- 20-m spacing between 0 to 325 m from the fence line
- 50-m spacing between 325 m to 500 m from the fence line
- 100-m spacing between 500 m to 2,000 m from the fence line

All receptors and source locations were expressed in the Universal Transverse Mercator North American Datum 1983, Zone 10 coordinate system. U.S. Geological Survey National Elevation Dataset terrain data were used in conjunction with the AERMAP preprocessor (Version 24142) to determine receptor elevations and terrain maxima.

Ambient Air Boundary

The ambient air boundary is defined by the property line that surrounds the Applicant-owned property within which non-authorized personnel access is precluded. The ambient air boundary for the Project facility is represented in Figure 5.1-4.

[3] Available online at https://www.baaqmd.gov/en/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/ceqa-modeling-data.



Legend

- Viracocha Hill BESS Project
- Meteorological Station

Source:
1) ESRI Aerial Images

N

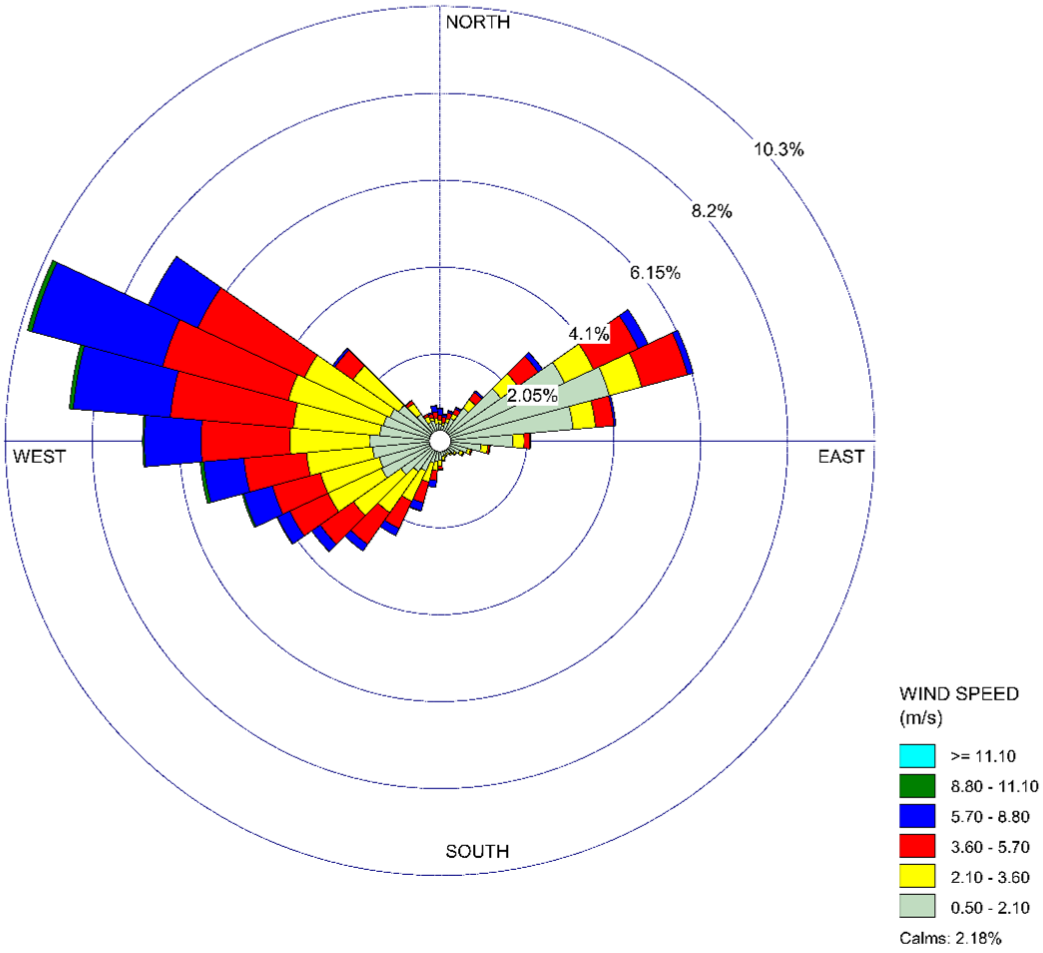
0 5 10
Miles

Figure 5.1-2
Meteorological Station Location
Viracocha Hill BESS Project
Alameda County, California

Jacobs

WIND ROSE PLOT:
Station #23285

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 1/1/2013 - 00:00** **End Date: 12/31/2017 - 23:59**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **2.18%**	TOTAL COUNT: **43693 hrs.**	
	AVG. WIND SPEED: **3.09 m/s**	DATE: **2/13/2025**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure 5.1-3
MET Wind Rose
Viracocha BESS Project
Alameda County, California

Jacobs

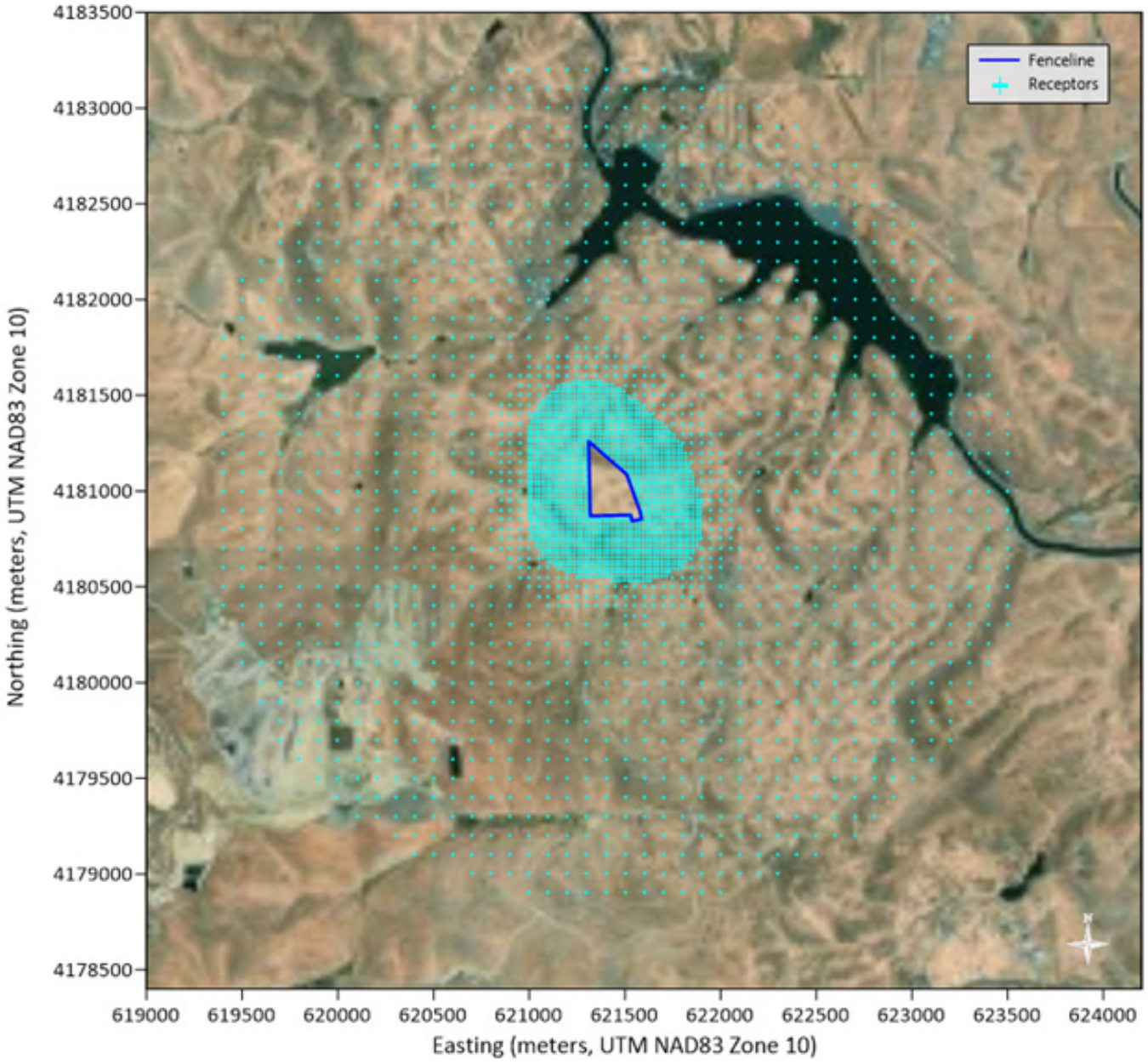


Figure 5.1-4
Disperions Modeling Receptor Grid and Facility Fenceline
Viracocha BESS Project
Alameda County, California

Jacobs

Building Downwash

Given that no new buildings are being constructed as part of the Project near the diesel emergency engine and the fire pump, AERMOD was executed without the incorporation of Building Profile Input Program for PRIME (BPIP-PRIME) or building downwash settings.

Rural versus Urban Option

According the BAAD Health Risk Assessment Modeling Protocol (BAAQMD 2020), the urban or rural determination can be made based on the population density within 3-kilometer (km) radius of the sources. If the density is greater than 750 people per square kilometer, Urban option should be used. Otherwise, the modeling shall use Rural options in the dispersion modeling. The land use surrounding the facility is open space without towns or cities within a 3-km radius. Because most of the areas within 3-km of the P Project are undeveloped open spaces that do not have populations of more than 750 people, the Rural option in AERMOD was used in the dispersion modeling analysis.

Source Characterization

The Project's operation emissions of criteria pollutants, GHGs, and TACs are presented in Section 5.1.6 and, unless otherwise noted, were used for modeling based upon the applicable pollutant and standard. Details of the source specific model inputs are provided in the following subsections.

- The modeled sources for Project operation include the diesel-fired emergency generator and the diesel fire pump engine. Details of the source specific model inputs and modeled emission rates are presented below. The source location and the facility fence line for the modeling are included in Figure 5.1-5.
- Emissions from O&M equipment and vehicles were not modeled because those operations are minimal, infrequent, varied spatially throughout the Project, and assumed to have negligible emissions and impacts on ground-level concentrations.
- The diesel emergency generator and fire pump were modeled as point sources in AERMOD with the stack height, flow rate, temperature, and location based on the design data provided by the vendors. Stack height was assumed to be 10 feet. Stack parameters used in the modeling analysis are presented in Table 5.1-12, and the emission rates used in the modeling are in Table 5.1-13. The normal operation schedule of the emergency generator and the fire pump would be 1 hour per day and 50 hours per year for routine maintenance and testing.

Table 5.1-12. Modeling Parameters – Diesel Emergency Generator and Fire Pump [a]

Source ID	Elevation (m) [b]	Release Height (m)	Discharge Temperature (K)	Discharge Velocity (m/s)	Stack Diameter (m)
Diesel Emergency Generator (ENG1)	130.68	3.05	815.37	101.98	0.10
Fire Pump (FP1)	130.68	3.05	815.37	101.98	0.10

[a] Modeling parameters presented in metric units to mirror what is presented in the modeling input/output files.

[b] The base elevation of the sources was determined using AERMAP. An average elevation was calculated assuming a graded facility.

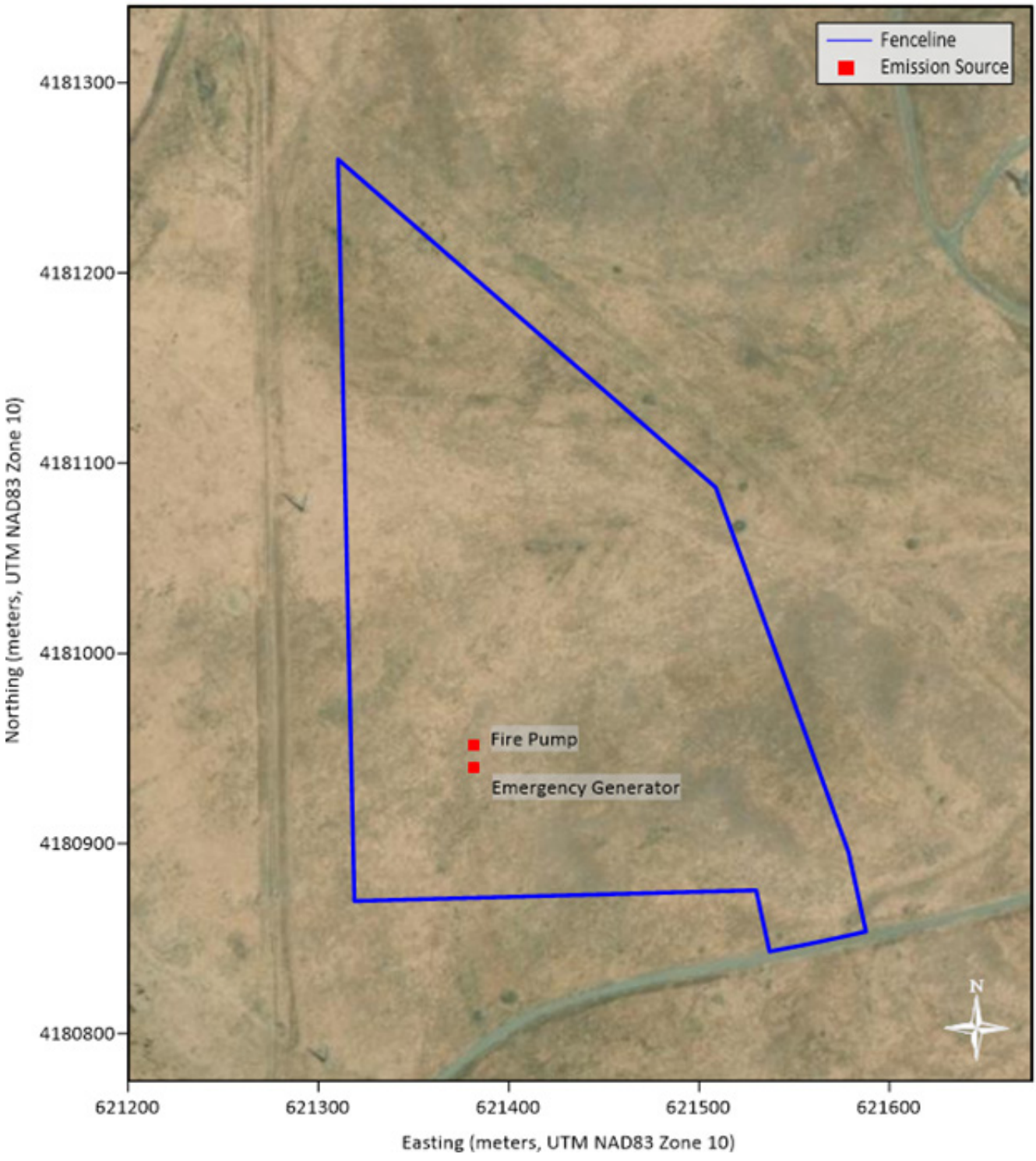


Figure 5.1-5
Operational Source Layout
Viracocha BESS Project
Alameda County, California

Jacobs

Table 5.1-13. Emission Rates – Diesel Emergency Generator and Fire Pump

Pollutant	Averaging Period	Unit	Diesel Emergency Generator (ENG1)	Fire Pump (FP1)
NO_2	1-hour	lb/hour	8.43E-03	9.44E-04
	Annual	tpy	3.69E-02	4.13E-03
CO	1-hour	lb/hour	7.68E+00	1.43E+00
	8-hour	lb/hour	7.68E+00	1.43E+00
SO_2	1-hour	lb/hour	1.48E-02	2.76E-03
	3-hour	lb/hour	1.48E-02	2.76E-03
	24-hour	lb/hour	1.48E-02	2.76E-03
	Annual	tpy	3.69E-04	6.89E-05
PM_{10}	24-hour	lb/hour	2.71E-03	3.44E-04
	Annual	tpy	1.63E-03	2.07E-04
$PM_{2.5}$	24-hour	lb/hour	2.71E-03	3.44E-04
	Annual	tpy	1.63E-03	2.07E-04

For purposes of the 1-hour standards, emergency engines in this analysis were classified as intermittent sources because they have less than 500 hours per year of operation according to EPA guidance (EPA 2011). As a result, the maximum 1-hour emission rate of the engines were not used in the modeling. Instead, the annual average hourly emissions were used in the modeling following the EPA's *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 NAAQS Memorandum* (EPA 2011).

Model Outputs

The modeled ground-level concentrations of pollutants represent the incremental concentration increase of each pollutant and averaging time period from the Project's operation emissions. The analysis includes evaluating modeled Project impacts on ground-level concentrations against the significant impact levels (SILs) established by the EPA to determine whether a project's criteria air pollutant emissions are considered inconsequential in comparison to the NAAQS. If the SILs are not exceeded, then a project's impacts would be considered insignificant, and no further analysis would be required.

For completeness, this analysis also evaluates Project emissions compared to the CAAQS and NAAQS even when it passes the SILs analysis.

Maximum short-term and annual impacts were used for determining compliance with all CAAQS because these standards are never to be exceeded. The same maximum impacts were also conservatively used for assessing compliance with the following NAAQS:

- 1-hour and 8-hour CO;
- 1-hour SO_2
- 3-hour and 24-hour SO_2; and
- 24-hour PM_{10}.

These same maximum impacts were also conservatively used for comparison to the NAAQS SILs.

- For 1-hour NO_2, the 5-year average of the annual 1-hour maxima and 98th annual percentiles of the 1-hour daily maximum were used for assessing compliance with the SIL and NAAQS, respectively.
- For 24-hour $PM_{2.5}$, the 5-year average of the annual 24-hour maxima and 98th annual percentiles were used for assessing compliance with the SIL and NAAQS, respectively.
- For annual $PM_{2.5}$, the 5-year average of the annual impacts was used for assessing compliance with both the SIL and NAAQS.

5.1.10 Environmental Analysis – Air Quality Impact Analysis Results

The following sections present the results of the air quality impact analyses for determining the changes to ambient air quality concentrations in the Project region as a result of Project operation. To determine the magnitude and location of the maximum air quality impacts for each pollutant and averaging period, the AERMOD model was used with all 5 years of meteorological data.

Table 5.1-14 summarizes the maximum modeled ground-level concentrations of each pollutant at the corresponding averaging time periods and the comparisons to EPA's SILs. The results demonstrate that all predicted concentration would be below the SILs. Therefore, the Project emissions would not be considered significant. The Project demonstrated compliance with the NAAQS/CAAQS, and it would not cause or contribute to a violation.

Table 5.1-14. Operation Air Quality Impact Results – Significant Impact Levels

Pollutant	Averaging Period	Modeled Maximum Concentration Increase (µg/m^3)	Class II SIL (µg/m^3)	Exceeds Class II SIL?
NO_2	1-hour maximum (CAAQS)	0.36	7.55	No
	5-year average of 1-hour average daily yearly maxima (NAAQS)	0.01	1.00	No
CO	Annual maximum	383	2,000	No
	1-hour maximum	282	500	No
SO_2	8-hour maximum	0.74	7.86	No
	1-hour maximum	0.69	25.0	No
	3-hour maximum	0.29	5.00	No
	24-hour maximum	< 0.01	1.00	No
PM_{10}	Annual maximum	0.05	5.00	No
	24-hour maximum	< 0.01	1.00	No
$PM_{2.5}$	Annual maximum	0.05	1.20	No
	5-year average of 24-hour average yearly maximum (NAAQS)	< 0.01	0.13	No

In addition to comparison with SILs, the Project's maximum modeled concentrations were combined with the background concentration of the area and are compared to the CAAQS and NAAQS in Table 5.1-15. The background concentrations were obtained from the 3-year monitoring data summarized in Table 5.1-3. As shown in Table 5.1-15, maximum combined impacts (modeled plus background) are all less than the CAAQS and NAAQS except for the PM_{10} CAAQS and NAAQS. The total concentration exceedances of the PM_{10} CAAQS and NAAQS are due to high background concentrations, which already exceed the CAAQS and NAAQS. As noted above. Incremental increase of $PM_{2.5}$ concentrations are negligible compared to the background concentrations, as shown in Table 5.1-15, and the facility is already projected to have maximum impacts less than the SILs for both 24-hour and annual PM_{10} (the only pollutant with background concentrations above the ambient air quality standard). In addition, the Project's emissions are expected to be less than CEQA significance thresholds for PM_{10}, as presented in Table 5.1-15.

5.1.11 Laws, Ordinances, Regulations, and Statutes

Table 5.1-16 presents a summary of federal, state, and local air quality LORS deemed applicable to the Project. Specific LORS related to air quality and climate change are discussed in greater detail in Sections 5.1.11.1 and 5.1.11.2, respectively.

Table 5.1-15. Operation Air Quality Impact Results – Ambient Air Quality Standards

Pollutant	Averaging Period	Modeled Conc. Increase ($\mu g/m^3$)	Background Conc. ($\mu g/m^3$)	Total Conc. ($\mu g/m^3$)	CAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Exceeds CAAQS Standard?	Exceeds NAAQS Standard?
NO_2	1-hour maximum (CAAQS)	0.36	78.96	79.32	339	--	No	--
	5-year average of 1-hour yearly 98th percentiles (NAAQS)	0.33	64.11	64.44	--	188	--	No
	Annual maximum	0.01	15.04	15.05	57	100	No	No
CO	1-hour maximum (CAAQS and NAAQS)	383	16,675	17,058	23,000	40,000	No	No
	8-hour maximum (CAAQS and NAAQS)	282	4,140	4,422	10,000	10,000	No	No
SO_2	1-hour maximum (CAAQS and NAAQS)	0.74	23.58	24.32	655	196	No	No
	3-hour maximum (NAAQS)	0.69	23.58	24.27	--	1,300 [a]	--	No
	24-hour maximum (CAAQS and NAAQS)	0.29	9.96	10.25	105	365	No	No
	Annual maximum (NAAQS)	< 0.01	3.54	3.54	--	80	--	No
PM_{10}	24-hour maximum (CAAQS)	0.05	173.5	173.55	50	--	Yes [b]	--
	24-hour average high-sixth-high (NAAQS)	0.03	149.2	149.23	--	150	--	No
	Annual maximum (CAAQS)	< 0.01	23.00	23.00	20	--	Yes [b]	--
$PM_{2.5}$	5-year average of 24-hour yearly 98th percentiles (NAAQS)	0.02	23.10	23.12	--	35	--	No
	Annual maximum (CAAQS)	< 0.01	7.90	7.90	12	--	No	--
	5-year average of annual concentrations (NAAQS)	< 0.01	8.00	8.00	--	9.0	--	No

Note:

-- = Not applicable and/or no standard

[a] Secondary standard.

[b] Note that the background concentration exceeds the CAAQS.

Table 5.1-16. Summary of LORS – Air Quality

LORS	Purpose	Regulating Agency	Project Conformance
Federal Regulations (EPA)			
CAA Amendments of 1990, 40 CFR Part 50	Establishes ambient air quality standards for criteria air pollutants.	EPA Region IX	The modeling analysis for the Project presented in Section 5.1.10 demonstrates that the Project will not cause or contribute to a violation of the state or federal ambient air quality standards.
40 CFR Part 51 (NSR)	Requires preconstruction review and permitting of new or modified stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient air quality standards.	BAAD with EPA Region IX oversight	Requires NSR permitting for construction of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than the NAAQS. The NSR requirements are implemented at the local level with EPA oversight (BAAD Regulation 2). An ATC and PTO will be obtained from BAAD prior to construction of the Project. As a result, the compliance requirements of 40 CFR 51 and BAAD Regulation 2 will be met.
40 CFR Part 52 (PSD)	Allows new sources of air pollution to be constructed, or existing sources to be modified in areas classified as attainment, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I Areas (e.g., national parks and wilderness areas).	BAAD with EPA Region IX oversight	The PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing major stationary source. BAAD classifies an unlisted source (which is not in the specified 28 source categories) that emits or has the PTE 250 tpy of any pollutant regulated by the CAA as a major stationary source. For listed sources, the threshold is 100 tpy. NO_x, VOC, or SO_2 emissions from a modified major source are subject to PSD if the cumulative emission increases for either pollutant exceeds 40 tpy. In addition, a modification at a nonmajor source is subject to PSD if the modification itself would be considered a major source. If the new source would require a PSD permit as a result of criteria pollutant PTE, a BACT analysis to evaluate GHG emissions control would be required. The Project would not be considered one of the 28 listed source categories under PSD. Therefore, the emission rates were compared to the 250-tpy threshold. As shown in Section 5.1.7, the emission increases from the Project would not exceed the 250-tpy threshold. Therefore, the Project would not be subject to PSD.
40 CFR Part 60 Subpart IIII (NSPS)	Establishes national standards of performance for new or modified stationary compression ignition internal combustion engines.	BAAD with EPA Region IX oversight	The Project will include one diesel-fired emergency generator and one diesel fire pump which are subject to operations, maintenance, and emissions requirements of this subpart. The Project's diesel generator will be operated and maintained as per the manufacturer specifications. The emergency generator and fire pump will be

LORS	Purpose	Regulating Agency	Project Conformance
			Tier 4 compliant, meaning its emissions will not exceed any of the emission limitations of this subpart.
40 CFR Part 70 (Title V) (BAAD Regulation 2 Rule 6)	CAA Title V Operating Permits Program.	BAAD with EPA Region IX oversight	The Title V Operating Permits Program requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. The requirements of 40 CFR Part 70 apply to facilities that are subject to NSPS requirements and are implemented at the local level through BAAD Regulation 2, Rule 6. According to Regulation 2, Rule 6, a facility would be required to submit a Title V application if the facility has a PTE greater than 100 tpy of any regulated air pollutant except GHGs or if the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs. A Title V application is only required for GHGs if the facility has a PTE greater than 100,000 tpy CO_2e. The Project will not exceed any Title V thresholds itself. All permitting will be conducted through BAAD and compliant with their rules and regulations.
40 CFR Part 63 (HAPs, MACT)	Establishes national emission standards to limit emissions of HAPs or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established from facilities in specific categories.	BAAD with EPA Region IX oversight	Establishes emission standards to limit emissions of HAPs from specific source categories for major HAP sources. Sources subject to 40 CFR Part 63 requirements must either use the MACT, be exempted under 40 CFR Part 63, or comply with published emission limitations. Projects would be subject to the 40 CFR Part 63 requirements if the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs. As shown in Section 5.1.7, the Project would not exceed the major source thresholds for HAPs (10 tpy for any one pollutant or 25 tpy for all HAPs combined). Therefore, the Project would be less than the 40 CFR Part 63 applicability threshold.
State Regulations (CARB)			
CHSC, Section 41700	Prohibits emissions in quantities that adversely affect public health, safety, businesses, or property.	BAAD with CARB oversight	The CEC Conditions of Certification and the BAAD ATC processes are developed to ensure that no adverse public health effects or public nuisances result from operation of the Project.
SB 32 – California Global Warming Solutions Act of 2016 (SB 32)	Aims to reduce carbon emissions within the state by approximately 40% from 1990 levels by the year 2030.	BAAD with CARB oversight	Requires CARB to develop regulations to limit and reduce GHG emissions. The Project is consistent with the local climate change action plan, the BAAD air quality plan, and will support the emission reduction goals of SB 32, as discussed in Section 5.1.6.

LORS	Purpose	Regulating Agency	Project Conformance
CARB's ATCM provisions.	Establish emission standards for diesel engines to reduce toxic diesel emissions	BAAD with CARB oversight	The Project will implement BMPs during construction, consistent with Section 5.1.6.2, which will comply with all applicable construction-related ATCM provisions. The Project operations will include stationary internal combustion engines which will be fired using ultra-low sulfur diesel with a sulfur content not to exceed 15 ppm by weight.
AB 617– Community Air Protection Plan	Establishes community air monitoring and emission reduction plans to reduce exposure in communities most impacted by air pollution.	BAAD with CARB oversight	The Project is not located in a community identified in AB 617. The Project will comply with all applicable BAAD emissions rules and regulations.
Local Regulations (BAAD)			
Regulation 2 Rule 1	Defines the types and permits required.	BAAD	An ATC and PTO will be obtained from BAAD prior to construction of the Project.
Regulation 2 Rule 2	Establishes preconstruction review requirements for new or modified stationary sources.	BAAD	The Project will demonstrate compliance in the permit application. An ATC and PTO will be obtained from BAAD prior to construction of the Project.
Regulation 2 Rule 5	Establishes preconstruction review requirements of TACs for new or modified stationary sources.	BAAD	The Project will demonstrate compliance in the permit application. An ATC and PTO will be obtained from BAAD prior to construction of the Project.
Regulation 2 Rule 6	CAA Title V Operating Permits Program.	BAAD with EPA Region IX oversight	The Title V Operating Permits Program requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. The requirements of 40 CFR Part 70 apply to facilities that are subject to NSPS requirements and are implemented at the local level through BAAD Regulation 2, Rule 6. According to Regulation 2, Rule 6, a facility would be required to submit a Title V application if the facility has a PTE greater than 100 tpy of any regulated air pollutant except GHGs or if the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs. A Title V application is only required for GHGs if the facility has a PTE greater than 100,000 tpy CO_2e. The Project will not exceed any Title V thresholds itself. All permitting will be conducted through BAAD and compliant with their rules and regulations.

LORS	Purpose	Regulating Agency	Project Conformance
Regulation 6 Rule 1	Establishes rules for Fugitive Dust	BAAD	Regulation 6 implements multiple fugitive dust standards and requirements for controlling and mitigating fugitive dust emissions at dust generating facilities in Rules 1 and 6. The ATC application to be filed with the BAAD will comply with all required fugitive dust rules and requirements as outlined in Regulation 6 Rule 1 and 6.
Regulation 6 Rule 6	Establishes rules for Fugitive Dust	BAAD	Regulation 6 implements multiple fugitive dust standards and requirements for controlling and mitigating fugitive dust emissions at dust generating facilities in Rules 1 and 6. The ATC application to be filed with the BAAD will comply with all required fugitive dust rules and requirements as outlined in Regulation 6 Rule 1 and 6.
Regulation 9 Rule 1	Establishes limits for sulfur dioxide emissions from all sources.	BAAD	The rule limits the sulfur content of emissions to not exceed 0.5% by weight for liquid fuels and 0.5% by weight for solid fuels. All diesel fuel combusted by the Project during construction and operations will be ultra-low sulfur diesel not to exceed 15 ppm sulfur.
Regulation 9 Rule 8	Establishes emission limitations for NOx and CO from internal combustion engines greater than 50 hp	BAAD	The Project's internal combustion emissions will not exceed the emission limitations in this rule.

ATC = authority to construct

ATCM = Airborne Toxic Control Measures

CFR = Code of Federal Regulations

CHSC = California Health & Safety Code

HAP = Hazardous Air Pollutants

MACT = Maximum Available Control Technology

NSPS = New Source Performance Standards

NSR = New Source Review

PTO = permit to operate

5.1.11.1 Specific LORS Discussion – Air Quality

Federal LORS

The EPA implements and enforces the requirements of many of the federal air quality laws. EPA has adopted the following stationary source regulatory programs in its effort to implement the requirements of the CAA, each of which are described in the following sections:

- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- PSD
- NSR
- Title V: Operating Permits Program

National Standards of Performance for New Stationary Sources–40 CFR Part 60, Subpart IIII. The NSPS program provisions limit the emissions of criteria pollutants from new or modified facilities in specific source categories. The applicability of these regulations depends on the equipment size or rating; material or fuel process rate; and/or the date of construction, or modification. Reconstructed sources also can be affected by NSPS.

Subpart IIII establishes emission and operational limits of criteria pollutants for new stationary compression ignition engines. All stationary diesel engines installed and operated at the Project will be compliant with operational and emission provisions in Subpart IIII specific to their respective engine types.

National Emission Standards for Hazardous Air Pollutants–40 CFR Part 63. The NESHAP program provisions limit HAP emissions from existing major sources of HAP emissions in specific source categories. The NESHAP program also requires the application of MACT to any new or reconstructed major source of HAP emissions to minimize those emissions. Subpart ZZZZ will be applicable to the Project's stationary diesel combustion engines (fire pump and emergency generator).

Prevention of Significant Deterioration Program–40 CFR Parts 51 and 52. The PSD program requires the review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies only to pollutants for which ambient concentrations do not exceed the corresponding NAAQS. The PSD program allows new sources of air pollution to be constructed and existing sources to be modified, while maintaining the existing ambient air quality levels in the Project region and protecting Class I areas from air quality degradation. The Project is not expected to trigger the PSD permitting requirements.

New Source Review–40 CFR Parts 51 and 52. The NSR program requires the review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment of NAAQS. NSR applies to pollutants for which ambient concentrations exceed the corresponding NAAQS. The Project's air quality impact analysis complies with all applicable NSR provisions, as shown in Section 5.1.10.

Title V – Operating Permits Program–40 CFR Part 70. The Title V Operating Permits Program requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. The proposed facility will not be subject to Title V permitting itself.

State LORS

CARB's jurisdiction and responsibilities fall into the following five areas: (1) implement the state's motor vehicle pollution control program; (2) administer and coordinate the state's air pollution research program; (3) adopt and update the CAAQS; (4) review the operations of the local air pollution control districts to ensure compliance with state laws; and (5) review and coordinate preparation of the State

Implementation Plan. Some key programs that support the above responsibilities, as applicable to the Project, are described in the following sections.

Assembly Bill 617 – Community Air Protection Program. AB 617 establishes the Community Air Protection Program (CAPP) to focus on reducing exposure in communities most impacted by air pollution. The CAPP establishes community-wide air monitoring and emission reduction programs as well as provides funding to incentivize early actions to deploy cleaner technologies in the affected communities.

Air Toxic "Hot Spots" Act – California Health & Safety Code Sections 44300-44384. The Air Toxics "Hot Spots" Information and Assessment Act requires the development of a statewide inventory of TAC emissions from stationary sources. The program requires affected facilities to: (1) prepare an emissions inventory plan that identifies relevant TACs and sources of TAC emissions; (2) prepare an emissions inventory report quantifying TAC emissions; and (3) prepare a health risk assessment (HRA), if necessary, to quantify the health risks to the exposed public. Facilities with significant health risks must notify the exposed population, and in some instances must implement risk management plans to reduce the associated health risks. The Project's compliance with this program is detailed in Section 5.9.

Public Nuisance – California Health & Safety Code Section 41700. Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or which endanger the comfort, repose, health, or safety of the public, or that damage business or property.

Airborne Toxic Control Measure for Stationary Compression Ignition Engines – 17 CCR Section 93115. This ATCM is aimed at reducing DPM and criteria pollutant emissions from stationary diesel-fueled compression ignition engines through fuel requirements, operational restrictions, and emission limits. The ATCM applies to points of sale of stationary compression ignition engines for use in California except portable engines, engines for motive power, auxiliary engines on marine vessels, and agricultural wind machines.

Local LORS – BAAD

BAAD is responsible for implementing regulations at the local level that minimize air emissions for purposes of complying with federal standards. Key regulations applicable to the Project are summarized as follows.

BAAD Regulation 2 – Rule 1 Permits -General Requirements. BAAD Regulation 2 establishes the basic framework for acquiring permits to construct and operate from the air district. The PTO will be the basis for the District's Determination of Compliance. A separate ATC application will be submitted to the BAAD. The ATC application, for the purposes of maintaining consistency with the PTO, will be similar in scope and detail, and will contain the required District permit application forms.

BAAD Regulation 2 – Rule 2 Permits – New Source Review. Regulation 2 Rule 2 establishes preconstruction review requirements for new or modified stationary sources. New sources are subject to BACT, offset, and air quality analysis to obtain an ATC/PTO if triggered.

BAAD Regulation 2 Rule 5 Permits - New Source Review of Toxic Air Contaminants. Regulation 2 Rule 5 applies preconstruction permit review to new and modified sources of TACs; contains project health risk limits and requirements for Toxics Best Available Control Technology. The Project will comply with all NSR TAC rules and other operational limitations. Details of the compliance demonstration to Regulation 2 Rule 5 are in Section 5.9.

BAAD Regulation 2 Rule 6 Major Facility Review. Regulation 2 Rule 6 implements the federal operating permit program at the local District level. The ATC application to be filed with the BAAD will contain all the required application forms.

BAAD Regulation 6 – Fugitive Dust Rules 1 and 6. Regulation 6 implements multiple fugitive dust standards and requirements for controlling and mitigating fugitive dust emissions at dust generating

facilities in Rules 1 and 6. The ATC application to be filed with the BAAD will comply with all required fugitive dust rules and requirements as outlined in Regulation 6 Rules 1 and 6.

BAAD Regulation 9, Rule 1– Sulfur Dioxide: Establishes limits for sulfur dioxide emissions from all sources. The rule limits the sulfur content of emissions to not exceed 0.5% by weight for liquid fuels and 0.5% by weight for solid fuels. All diesel fuel combusted by the Project during construction and operations will be ultra-low sulfur diesel not to exceed 15 ppm sulfur.

***Regulation 9, Rule 8 – Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines*:** Establishes emission limitations for NOx and CO from internal combustion engines greater than 50 hp. The Project's internal combustion emissions will not exceed the emission limitations in this rule.

In addition to the District rules, BAAD develops air quality plans for the region. The most recent air quality plan adopted by BAAD, titled Bay Area 2017 Clean Air Plan: Spare the Air, Cool the Climate, is the applicable air quality plan for projects in Alameda County (BAAQMD 2017b). The Clean Air Plan provides an integrated, multi-pollutant control strategy to reduce emissions of ozone, particulates, air toxics, and GHGs.

5.1.11.2 Specific LORS Discussion – Climate Change and Global Warming

State law defines GHGs to include the following: CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 (California Health and Safety Code Section 38505[g]). The most common GHG that results from human activity is CO_2, followed by CH_4 and N_2O. Key federal, state, and local legislative actions associated with GHG emissions and climate change are described in the following sections. As an energy storage facility supporting the state's pursuit of an environmentally clean and reliable electrical system, the project is consistent with the federal, state, and regional regulations related to GHG and climate change described in the following sections.

Federal Legislative Action

Executive Order 13423, signed by President George W. Bush on May 14, 2007, directed the EPA and the U.S. Department of Transportation (DOT) to establish regulations to reduce GHG emissions from on-road and non-road motor vehicles and non-road engines by 2008. In 2009, the National Highway Traffic Safety Administration (NHTSA) finalized a rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011 and further expanded the rule to model years 2012 through 2016 in 2010.

On December 19, 2007, Congress passed the Energy Independence and Security Act of 2007, which aims to reduce GHG emissions at a national level and strengthen the initiatives established by Executive Order 13423. The act's two key measures include the following: 1) increasing the supply of alternative fuel sources through mandatory Renewable Fuel Standards by requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, and 2) establishing a target of 35 miles per gallon of fuel efficiency for a combined fleet of cars and light-duty trucks by model year 2020. The act also required the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and a fuel economy standard for work trucks.

On October 30, 2009, the EPA published the Mandatory Reporting Rule (codified in 40 CFR Part 98), that requires mandatory reporting of GHG emissions from large sources and suppliers in the United States. In general, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, facilities that inject CO_2 underground, users of electrical transmission and distribution equipment, and facilities that emit 25,000 MT or more per year of CO_2e emissions are required to submit annual reports to the EPA.

On December 7, 2009, the EPA Administrator signed two findings regarding GHGs in direct response to the U.S. Supreme Court's decision in *Massachusetts v. EPA* (No. 05-1120). The first finds that the current and projected concentrations of the six key well-mixed GHGs in the atmosphere (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. The second finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare (EPA 2009).

On June 3, 2010, the EPA promulgated the final GHG Tailoring Rule (75 Federal Register [FR] 31514). The GHG Tailoring Rule established clear applicability thresholds for stationary source emitters of GHGs under PSD and Title V regulations. In general, any new stationary source with GHG emissions of 100,000 tpy CO_2e or greater became subject to both PSD review and the Title V program. On June 23, 2014, the U.S. Supreme Court issued a decision prohibiting the EPA from considering GHG emissions when determining PSD review and Title V program applicability (*Utility Air Regulatory Group v. EPA*, No. 12-z1146). Per the U.S. Supreme Court decision, the EPA may continue to require GHG emission limitations in PSD and Title V permits, if PSD review and the Title V program are triggered by emissions of criteria pollutants (EPA 2025d). Because no stationary sources of this magnitude are associated with the Project, PSD and Title V regulations would not apply to the Project.

The federal government has taken steps to improve fuel economy and energy efficiency to address climate change and its associated effects. The most important of these steps was the Energy Policy and Conservation Act of 1975 (United States Code Title 42, Part 6201), as amended by the Energy Independence and Security Act of 2007, and the Corporate Average Fuel Economy (CAFE) standards. The NHTSA sets and enforces the CAFE standards based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States. EPA calculates average fuel economy levels for manufacturers and also sets related GHG emissions standards under the CAA. Raising CAFE standards leads automakers to create a more fuel-efficient fleet, which improves our nation's energy security, saves consumers money at the pump, and reduces GHG emissions.

In December 2021, EPA published a final rulemaking that raised federal GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026, increasing in stringency each year. The updated GHG emissions standards are anticipated to eliminate more than 3 billion tons of GHG emissions through 2050. In May 2022, NHTSA published corresponding new fuel economy standards for model years 2024 through 2026, which are anticipated to reduce fuel use by more than 200 billion gallons through 2050 compared with the old standards and reduce fuel costs for drivers (EPA 2022). On March 29, 2024, EPA issued a final rule "Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3" to revise existing standards to reduce GHG emissions from heavy-duty vehicles in model year 2027 and set new, more stringent standards for model years 2028 through 2032. The final standards for heavy-duty vehicles will avoid approximately 1 billion metric tons of GHG emissions from 2027 through 2055, making an important contribution to efforts to limit climate change and its impacts such as heat waves, drought, sea level rise, extreme climate and weather events, coastal flooding, and wildfires (EPA 2024).

State Legislative Action

In response to the transportation sector accounting for more than half of California's CO_2 emissions, AB 1493 was passed in July 2002, requiring CARB to establish GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined to be vehicles that are primarily used for non-commercial personal transportation within the state. Specifically, AB 1493 required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004, which were intended to reduce GHG emissions by approximately 22% in the near-term (2009 through 2012), as compared to emissions from the 2002 fleet, and by approximately 30% in the mid-term (2013 through 2016).

The framework for regulating GHG emissions in California falls under the implementation requirements of the Global Warming Solutions Act of 2006 (referred to as AB 32), which was signed into law by the California State Legislature in 2006 and updated by SB 32. AB 32 required CARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions would be reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit was 431 million MT CO_2e; CO_2 emissions account for approximately 90% of this value. In 2016, SB 32 provided a post-2020 GHG emission reduction target of 40% below 1990 levels by 2030.

Issued on January 18, 2007, Executive Order S-1-07 set a declining Low Carbon Fuel Standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The goal of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. Carbon intensity is a measurement of the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. The regulation, adopted by CARB in April 2009, was expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste. The Low Carbon Fuel Standard was amended in 2011, 2015, and most recently in 2018, all of which strengthen the implementation and carbon benchmarks through 2030 to help achieve the statewide emission targets of AB 32 and SB 32.

In December 2007, CARB adopted the first regulation pursuant to AB 32, which requires mandatory reporting of GHG emissions from large emitting facilities, suppliers, and electricity providers. This regulation was significantly revised to better align with EPA's Mandatory Reporting Rule; the revised regulation became effective January 1, 2013. The current regulation, which includes additional minor revisions to accommodate the Cap and Trade Program, became effective January 1, 2015. CARB adopted the California Cap and Trade Program on October 20, 2011. Under the California Cap and Trade Program, covered entities have had an obligation to secure GHG allowances or offsets since 2013; fuel suppliers have had an obligation to secure GHG allowances or offsets since 2015. The California Cap and Trade Program will be in effect until at least December 31, 2030, through the 2017 adoption of AB 398 (Climate Action Reserve 2017).

In 2008, SB 375 was signed into law, addressing GHG emissions associated with the transportation sector through regional transportation and sustainability plans. Specifically, SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-duty truck sector for 2020 and 2035. Once adopted, regional metropolitan planning organizations (MPOs) are responsible for preparing a Sustainable Communities Strategy, to be included within their Regional Transportation Plan, which forecasts a regional development pattern that will achieve, if feasible, SB 375's GHG reduction targets. If a Sustainable Communities Strategy is unable to achieve the GHG reduction target, an MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

The first Climate Change Scoping Plan, a plan required by AB 32, was also approved in 2008. This plan, which is to be updated at least every 5 years, includes a suite of policies to help the State achieve its GHG targets, in large part leveraging existing programs whose primary goal is to reduce harmful air pollution. The currently operative plan is the 2022 Scoping Plan, which assesses progress toward achieving the SB 32 2030 target and lays out a path to achieve carbon neutrality by 2045 (CARB 2022).

In January 2012, CARB approved the Advanced Clean Cars program, a new emissions-control program for model years 2015 through 2025. The program presents a single coordinated package that includes elements for emission reductions of GHGs and smog- and soot-causing pollutants, promotion of clean cars, and providing fuels for clean cars. To improve air quality, CARB has implemented new emission standards to reduce smog-forming emissions beginning with 2015 model year vehicles. It is estimated that cars will emit 75% less smog-forming pollution in 2025 than the average new car sold in 2012. To reduce GHG emissions, CARB, in conjunction with the EPA and NHTSA, has adopted new vehicle GHG standards for model years 2017 through 2025; the new standards are estimated to reduce GHG emissions by 40% in 2025, as compared to model year 2012. The Zero Emissions Vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles for model years 2018 through 2025. The Advanced Clean Cars II Program was approved in 2022, which developed rules and standards for vehicle model years 2026 through 2035. It will rapidly scale down emissions of light-duty passenger cars, pickup trucks, and sport utility vehicles by amending the ZEV regulation to require an increasing number of ZEVs and amending the Low-Emission Vehicle Regulation to increase the stringency of standards for gasoline cars and heavier passenger trucks (CARB 2025c).

Executive Order B-16-12 was also issued in 2012 and directs state entities under the Governor's direction and control to support and facilitate the development and distribution of ZEVs. This Executive Order also sets a long-term target of reaching 1.5 million ZEVs on California's roadways by 2025, effectively reducing GHG emissions from the transportation sector to 80% below 1990 levels by 2050. In furtherance of this Executive Order, the Governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

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% by 2020 to 50% by 2030. SB 100, signed into law in 2018, requires California utilities to reach 50% renewable resources by December 31, 2026, and 60% by December 31, 2030. SB 100 also establishes policy that renewable energy resources and other zero-carbon resources supply 100% of all retail sales of electricity by December 31, 2045. As a renewable energy resource, the Project will support achievement of these goals.

AB 1236, signed into law in October 2015, requires a city, county, or city and county to approve applications for the installation of electric vehicle charging stations. The intent of AB 1236 is to implement the timely and cost-effective installation of electric vehicle charging stations, each of which meets specified statewide standards.

Under AB 32, CARB, as the principal state agency in charge of regulating sources of GHG emissions in California, has been tasked with adopting regulations for the reduction of GHG emissions. The effects of this proposed Project are evaluated based both upon the quantity of GHG emissions and whether the Project implements reduction strategies identified in the 2022 Scoping Plan.

5.1.12 Agency Jurisdiction and Contacts

Table 5.1-17 presents the contact information for each agency that may exercise jurisdiction over air quality issues and permitting that was contacted during the development of this Project.

Table 5.1-17. Agency Contacts for Air Quality

Air Quality Concern	Agency	Contact
Public exposure to air pollutants	CEC	Wenjun Qian, Ph.D., P.E. Air Resources Engineer California Energy Commission 715 P St, MS-46 Sacramento, CA 95814 Email: Wenjun.Qian@energy.ca.gov Phone: 916-477-1339
	BAAD	Xuna Cai Senior Air Quality Engineer Bay Area Air Quality Management District 375 Beale Street Suite 600 San Francisco, CA 94105 Phone: 415-749-4788 xcai@baaqmd.gov

5.1.13 Permit Requirements and Schedules

An ATC application is required in accordance with the BAAD's rules. The ATC application submitted to the BAAD will consist of the Project description, emission estimates, rule compliance evaluation, and application forms.

5.1.14 References

Alameda County. 2014. Community Climate Action Plan https://www.acgov.org/cda/planning/generalplans/documents/110603_Alameda_CCAP_Final.pdf.

Bay Area Air Quality Management District (BAAQMD). 2020. *BAAQMD Health Risk Assessment Modeling Protocol*. Accessed March 2025. https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en.

Bay Area Air Quality Management District (BAAQMD). 2017a. *California Environmental Quality Act Air Quality Guidelines.* https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en.

Bay Area Air Quality Management District (BAAQMD). 2017b. *FINAL 2017 CLEAN AIR PLAN: Cool the Climate*. Vol. 1. Accessed March 2025. https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf.

Bay Area Air Quality Management District (BAAQMD). 2022. CEQA Thresholds and Guidelines Update. Accessed online at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines.

Bay Area Air Quality Management District (BAAQMD). 2025. BACT/TBACT Workbook. https://www.baaqmd.gov/permits/permitting-manuals/bact-tbact-workbook.

California Air Resources Board (CARB). 2022. Final 2022 Scoping Plan Update and Appendices. Accessed March 2025. https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

California Air Resources Board (CARB). 2024. California Ambient Air Quality Standards. https://ww2.arb.ca.gov/sites/default/files/2024-08/AAQS%20Table_ADA_FINAL_07222024.pdf.

California Air Resources Board (CARB). 2025a. Ambient Air Quality Standards Designation Tool. https://ww2.arb.ca.gov/capp/cst/tch/ambient-air-quality-standards-designation-tool.

California Air Resources Board (CARB). 2025b. "iADAM Air Quality Data Statistics Select 8 Summary." Accessed March 2025. https://www.arb.ca.gov/adam.

California Air Resources Board (CARB). 2025c. Advanced Clean Cars II. https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii.

CAPCOA. 2025. California Emission Estimator Model (CalEEMod). https://www.caleemod.com/.

Climate Action Reserve. 2017. "AB 398: California extends cap-and-trade program." July. https://www.climateactionreserve.org/blog/2017/07/20/ab-398-california-extends-cap-and-trade-program/

Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. Geneva, Switzerland, 151 pp.

U.S. Environmental Protection Agency (EPA). 2009. "Greenhouse Gas Emissions: Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act." Accessed March 2025. https://www.epa.gov/climate-change/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-clean-air-act-0.

U.S. Environmental Protection Agency (EPA). 2011. Memorandum: Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard. March.

U.S. Environmental Protection Agency. 2022. "Regulations for Greenhouse Gas Emissions from Commercial Trucks & Buses." Accessed March 2025. https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-commercial-trucks.

U.S. Environmental Protection Agency (EPA). 2024. *Final Rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3*. Accessed March 2025. https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-greenhouse-gas-emissions-standards-heavy-duty.

U.S. Environmental Protection Agency (EPA). 2025a. NAAQS Table. Accessed March 2025. https://www.epa.gov/criteria-air-pollutants/naaqs-table.

U.S. Environmental Protection Agency (EPA). 2025b. California Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Accessed March 2025. https://www3.epa.gov/airquality/greenbook/anayo_ca.html.

U.S. Environmental Protection Agency (EPA). 2025c. "Air Data: Air Quality Data Collected at Outdoor Monitors Across the US. Monitor Values Report." Accessed March 2025. https://www.epa.gov/outdoor-air-quality-data/monitor-values-report.

U.S. Environmental Protection Agency (EPA). 2025d. "New Source Review (NSR) Permitting: Clean Air Act Permitting for Greenhouse Gases." Accessed March 2025. https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases.

5.2 Biological Resources

This section describes the existing conditions of the Project footprint and Biological Study Area (BSA), the regulatory framework that underlies this analysis, and potential impacts on biological resources that may result from the proposed Viracocha Hill Battery Energy Storage System (Viracocha Hill BESS or Project). The Project will be located within approximately 25 acres of a 443-acre parcel (APN 99B-7300-1-5) and will consist of a BESS yard, laydown area, substation, and stormwater retention pond. The exact design and location of these features will be refined as the Project moves forward. Additionally, the Project includes access road improvements and a gen-tie line connecting to the Ralph Substation. If expanding the Ralph Substation is unavailable, a new switching station or a line-tap will be developed adjacent to the existing substation.

Section 5.2.1 describes the existing resources that could be affected by the Project. Section 5.2.2 presents potential environmental effects of Project construction and operation. Section 5.2.3 discusses cumulative Project effects. Section 5.2.4 discusses proposed mitigation measures. Section 5.2.5 presents applicable laws, ordinances, regulations, and standards (LORS). Section 5.2.6 lists involved agencies, Section 5.2.7 addresses permits, and Section 5.2.8 provides the references consulted.

The Applicant contracted Jacobs Engineering Group, Inc. (Jacobs) to provide biological support services. To this end, Jacobs biologists are in the process of conducting the following biological surveys to support this analysis: a reconnaissance-level habitat assessment survey and preliminary bat habitat assessment; protocol-level botanical surveys; focused target invasive plant surveys; protocol-level wildlife surveys; and an aquatic resource delineation.

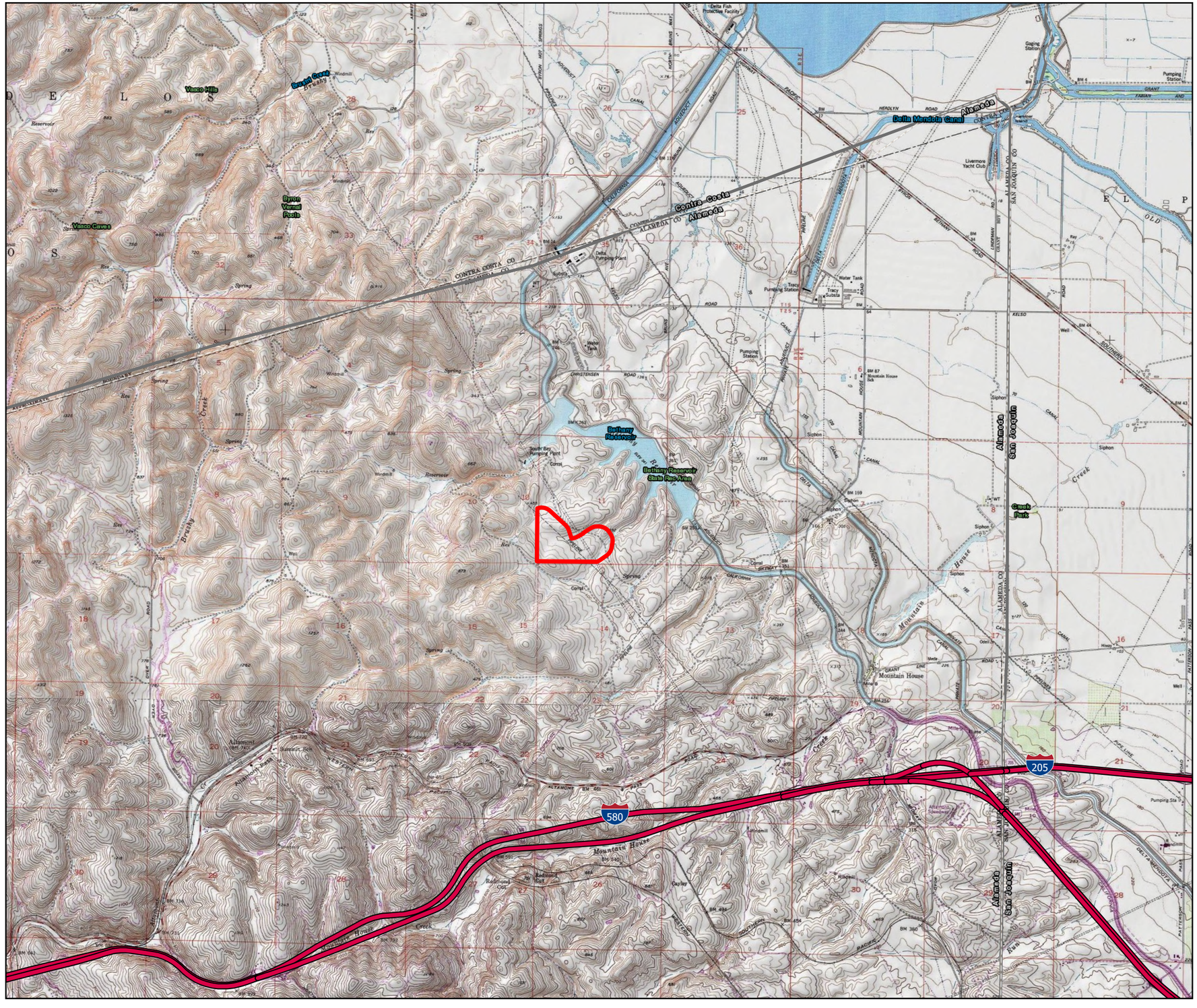
As indicated, the elements of the Project have been determined, but their exact locations and orientation may be updated as design progresses. The Project footprint includes all permanent and temporary impacts associated with construction of the Project and is expected to be approximately 25 acres. All Project work is anticipated to occur within the Project footprint.

Potential permanent impacts include the following areas:

- An approximately 17-acre area containing the BESS yard, laydown area, substation, and stormwater retention pond
- Modification of the existing approximately 1.1-acre Ralph Substation
- A new approximately 2.1-acre switching station or a line-tap (if-needed)
- A proposed access road entrance improvement totaling 0.15 acre
- Improvements to 0.3 mile of an access road using a 50-foot buffer resulting in the removal of approximately 3.5 acres of grassland
- A 1,325-foot gen-tie line using a 25-foot buffer resulting in an additional approximately 0.6 acre of grassland removal

Potential temporary impacts include the gen-tie line buffered between 25 feet and 50 feet from centerline along 1,325 feet, resulting in approximately 0.70 acre of temporary impacts. All other temporary impacts for Project features will occur within the permanent impact area. In accordance with California Energy Commission (CEC) regulations, the Project footprint was buffered by 1 mile and linear corridors were buffered by 1,000 feet.

For the purposes of the biological resources analysis, biologists surveyed a larger area than the approximately 25-acre proposed Project footprint to accommodate potential shifts in Project features, including to avoid sensitive areas. The BSA therefore is defined as the approximately 25-acre proposed Project footprint as well as a 500-foot buffer of the Project footprint, and measures approximately 130.31 acres. Figures 5.2-1 and 5.2-2 provide the location of the BSA and the proposed Project elements within the BSA, respectively.



Legend

500-ft Biological Study Area

Source:
1) ESRI Aerial Images

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Figure 5.2-1
Project Location
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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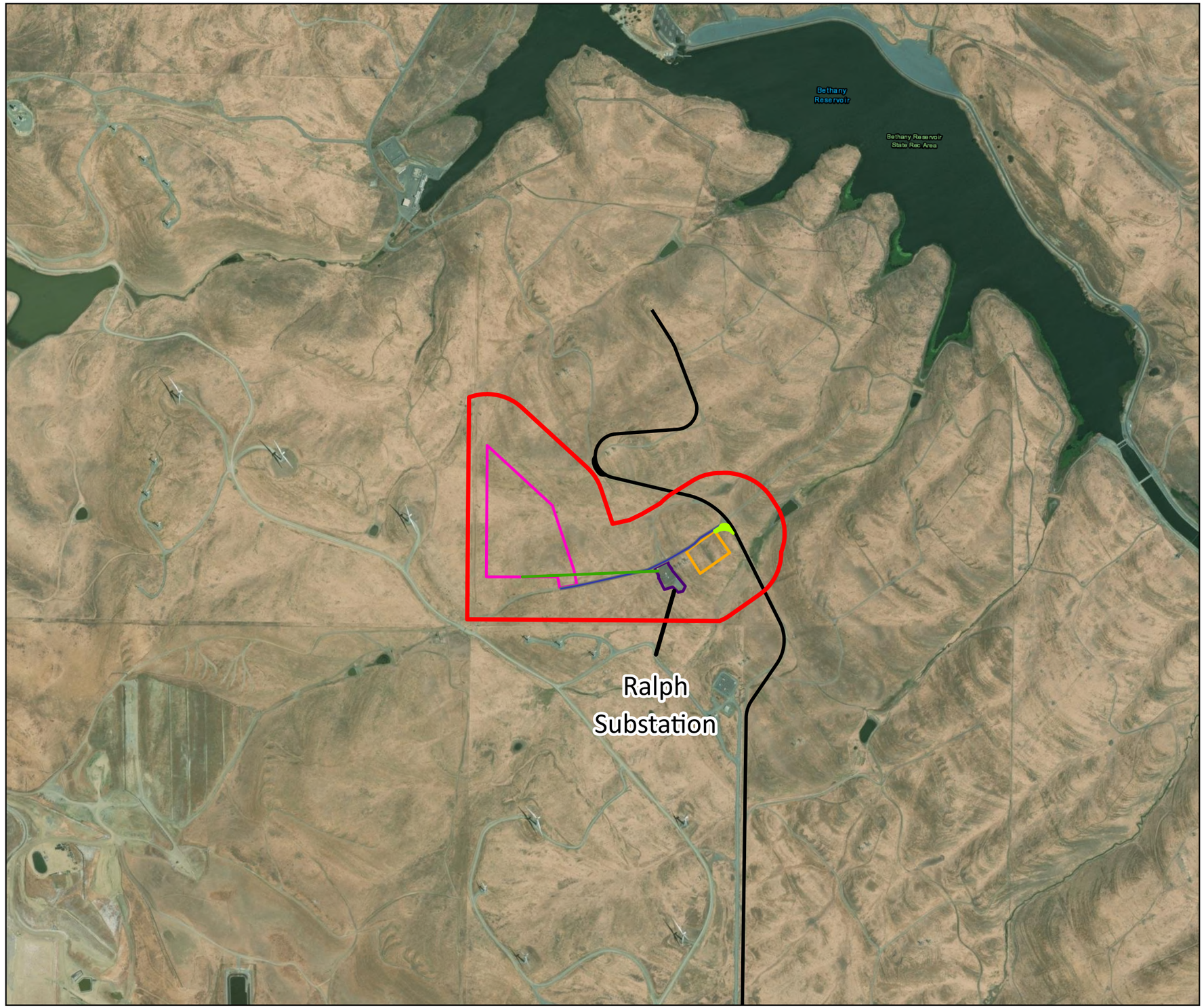

Legend

- 500-ft Biological Study Area
- Proposed 230-kV Gen-Tie
- Proposed Access Road Widening Area
- Proposed Improvements to Existing Access Road
- Proposed Alternate Substation Area
- Ralph Substation
- Proposed Viracocha BESS Equipment Yard
- Wind Farm Road (No Improvements)

Source:
1) ESRI Aerial Images

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Miles

Figure 5.2-2
Project Components
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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The biological resources evaluation presented here:

- Discusses the affected environment, including a regional overview, vegetation types, and habitat present in the BSA, invasive plant species with the potential to or that are known to occur within the BSA, wildlife likely to occur within the BSA, and special-status species with the potential to occur within the BSA and vicinity.
- Presents the results of biological surveys in the BSA and near the Project footprint.
- Presents an environmental analysis of the Project, including standards of significance, potential impacts of construction and operation of the Project, and impacts on special-status species.
- Evaluates any potential cumulative effects on biological resources in the Project vicinity.
- Identifies proposed mitigation measures that will avoid, minimize, or compensate for adverse impacts.
- Demonstrates conformance with applicable LORS.
- Identifies the regulatory agency contacts.
- Identifies permit requirements.
- Presents the references used to prepare this section, all figures depicting Project layout, locations of known special-status species records, vegetation and land cover types, and tables of all potential special-status species within the BSA.
- Includes U.S. Army Corps of Engineers (USACE) wetland determination forms and photos presented in an Aquatic Resources Delineation Report (ARDR) attached in Appendix 5.2A.

5.2.1 Affected Environment

This subsection discusses the affected environment of the Project, including vegetation communities and land cover types, aquatic resources, invasive plant species, and special-status plant and wildlife species with potential to occur. Results from the field surveys, habitat evaluations, and aerial imagery interpretation were evaluated to address the potential for presence of biological and aquatic resources in the BSA.

The BSA is located on privately owned lands under the jurisdiction of Alameda County, California in the southwest quarter of the southwest quarter of the Clifton Court Forebay U.S. Geological Survey (USGS) 7.5′ quadrangle between 300 and 500 feet elevation above sea level (Figures 5.2-1 and 5.2-2). Current land use in the BSA includes wind power generation, electrical transmission, and cattle grazing.

5.2.1.1 Regional Overview

The BSA lies within the Eastern Hills Subsection (M262Ad) of the Central California Coast Ranges Section of California (Miles and Goudy 1998). This subsection consists of the hills and low mountains in the eastern and southern portions of the Diablo Range, with elevations between 100 feet and 3,000 feet. Geologically the subsection consists of Franciscan Complex and Great Valley Sequence rocks. Regionally, the climate is hot and subhumid to arid. Mean annual temperatures range from 50 degrees Fahrenheit (°F) to 60°F in (Miles and Goudy 1998). Based on climate records from the Tracy Pumping Plant (049001) weather station located approximately 2.4 miles northeast of the BSA, average monthly temperatures range from a low of 36.7°F in January to a high of 89°F in July. Average annual precipitation is 14.18 inches, with most of the rainfall occurring from November to March, and minimal rainfall from April through October (WRCC 2025, Table 5.2-1). The BSA is located within the Clifton Court Forebay Hydrologic Unit (Code 180400030604). Bethany Reservoir and its associated recreation area are located less than half a mile east of the Project. The hydrology of aquatic resources in the BSA is primarily influenced by precipitation and seasonal runoff.

Table 5.2-1. Monthly Climate Summary, Tracy Pumping Plant, California (049001), 1955 to 2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	54.8	61.2	66.4	72.2	79.7	87.2	92.6	91.9	87.7	78.3	64.7	55.2	74.3
Average Min. Temperature (°F)	38.3	41.9	44.7	47.8	53.4	57.8	60.5	60.4	58.3	52.3	44.2	38.6	49.9
Average Total Precipitation (inches)	2.54	2.13	1.57	0.83	0.40	0.13	0.03	0.06	0.23	0.65	1.56	1.91	12.03

Source: WRCC 2025

Habitats in the BSA are primarily nonnative annual grasslands with developed electrical transmission infrastructure and roadways, herbaceous wetlands, and stock ponds. A map of the Altamont and San Ysidro series soils within the BSA is provided in the attached ARDR in Appendix 5.2A.

Wildlife Movement Corridors

Wildlife movement corridors are areas important for habitat connectivity essential to the dispersal, migration, and geneflow of wildlife populations. Fragmentation of habitats due to human development has reduced the ability for wildlife movement through the landscape posing a risk to California's diverse natural communities. Areas in the state essential to maintaining ecological linkages were mapped in the California Essential Habitat Connectivity Project (CEHCP) (Spencer et al. 2010) and connectivity importance was assessed in the California Department of Fish and Wildlife's (CDFW's) Areas of Conservation Emphasis (ACE) (CDFW 2025d). The BSA falls within an CEHCP Essential Connectivity Area and an ACE Irreplaceable and Essential Corridor. The primary barriers to connectivity in this area are Interstate 580 and Altamont Pass Road; however, fencing and human activity, such as driving on unpaved roadways to manage cattle or wind energy and transmission infrastructure, may pose as deterrents to some species.

5.2.1.2 Significant Regional Protected Areas

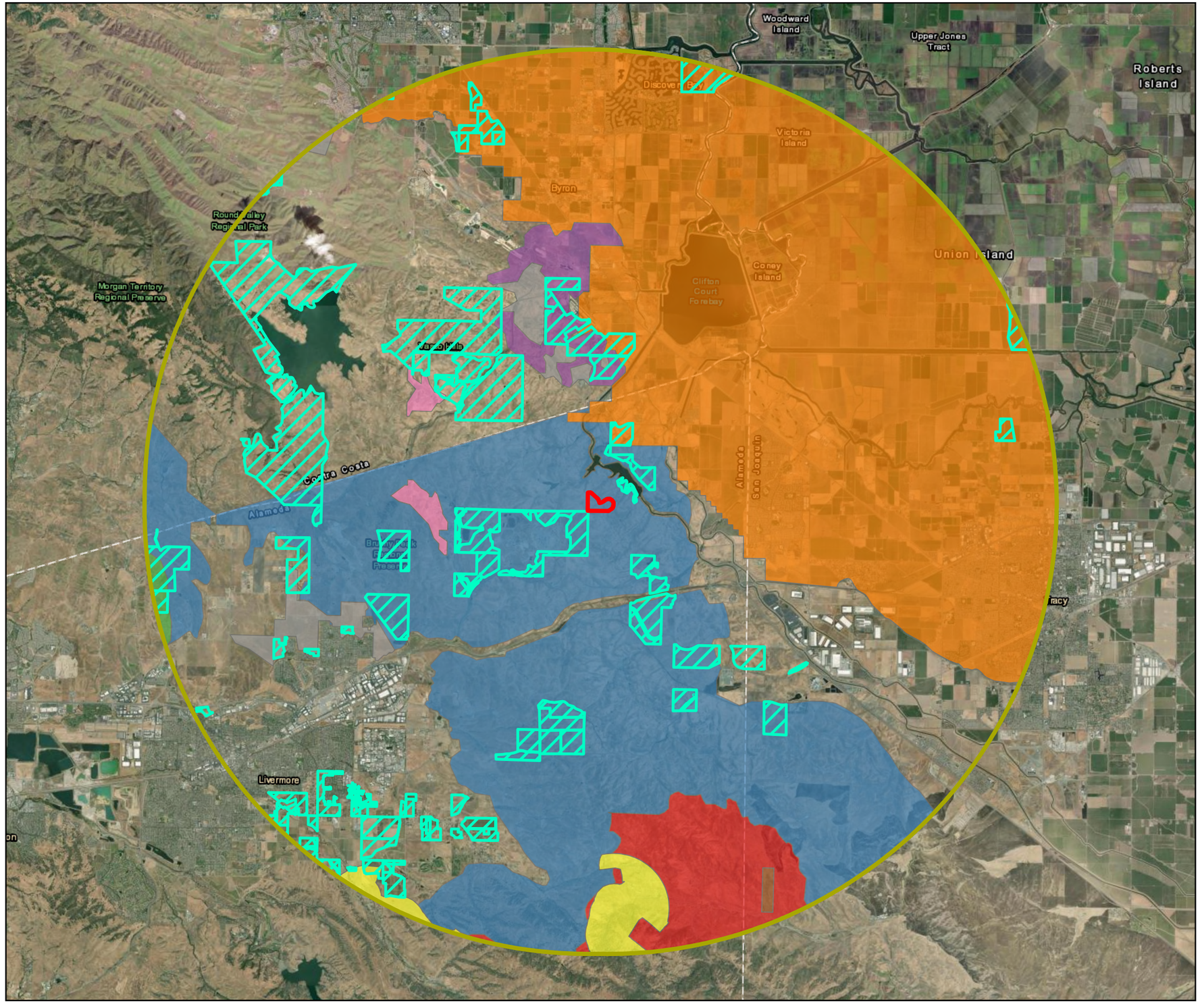
Numerous important ecological reserves and designated open spaces occur within the region. These protected areas provide important habitat for migratory birds along the Pacific Flyway, as well as habitat for several special-status plant and wildlife species. Protected areas within the 10 miles of the Project area are described below:

CDFW holds numerous conservation easements in and around the Altamont Pass Wind Resource Area (APWRA) for species protected by the California Endangered Species Act (CESA). The closest of these easements does not overlap the proposed Project but is within 0.1 mile southwest of the Project and is part of mitigation easements that encircle the nearby Waste Management Altamont Landfill and Resource Recovery property (CPAD 2025, Figure 5.2-3).

California Department of Water Resources and State Parks operate the Bethany Reservoir State Recreation Area and the Clifton Court Forebay, which act as the initial storage and support pumping operations to elevate water from the Sacramento–San Joaquin River Delta to the California Aqueduct, where it flows south supplying water to much of the state's population (State Parks 2025). Bethany Reservoir is approximately 0.5 mile east of the BSA.

California Department of Parks and Recreation (State Parks) operates Marsh Creek State Historic Park approximately 9 miles northwest from the BSA. It was established in 2012, conserving 3,659 acres of natural habitats and unique historical features (State Parks 2025).

Contra Costa Water District (CCWD) manages the Los Vaqueros Reservoir and surrounding watershed 5.5 miles to the northwest and the Mendoza Ranch 1.2 miles to the south. Los Vaqueros Reservoir is an artificial waterbody irrigated from the Delta. The surrounding area is home to nesting bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos)*, California tiger salamander (*Ambystoma californiense*), and California red-legged frog (*Rana draytonii*). Mendoza Ranch is a mitigation property that is actively grazed which was acquired as part of the expansion of the Los Vaqueros Reservoir in 2010 (CCWD 2025).



Legend

- 500-ft Biological Study Area
- 10-miles From Study Area
- Conservation Easement

Critical Habitat

- Alameda whipsnake (=striped racer)
- California red-legged frog
- California tiger Salamander
- Contra Costa goldfields
- Delta smelt
- Foothill yellow-legged frog
- Large-flowered fiddleneck
- Longhorn fairy shrimp
- Vernal pool fairy shrimp

Source:
1) ESRI Aerial Images

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Miles

Figure 5.2-3
Critical Habitat and Conservation Easements Within 10 Miles of the Project Area
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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East Bay Regional Park District (EBRPD) manages Brushy Peak Regional Preserve and Byron Vernal Pools Preserve. Brushy Peak Regional Preserve is a 1,979-acre park used for hiking and wildlife viewing located 4.5 miles west from the BSA and managed in conjunction with the Livermore Area Recreation and Park District (EBRPD 2025a). Byron Vernal Pools Preserve is located 2.5 miles to the northwest and was acquired by EBRPD to protect vernal pool habitats and the rare species that inhabit them (EBRPD 2025b).

East Contra Costa County Habitat Conservancy (ECCCHC) oversees the implementation and management of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCCHCP/NCCP). Although not directly protecting specific parcels of land, the ECCCHC oversees the application and operation of the ECCCHCP/NCCP, including disclosure and mitigation of impacts on 28 species of plants and wildlife, including those listed under the Federal Endangered Species Act (ESA) and others considered to be of special status and warranting regional management within the plan area, which covers Contra Costa County east from the Mount Diablo summit to the San Joaquin County line (ECCCHC 2025). The BSA is located 2.4 miles southeast from the plan area.

Mountain House Community Services District manages the riparian zone of Mountain House Creek (Creek Park) where it flows through the incorporated City of Mountain House development 3.2 miles east of the BSA. It is managed as an open space park for hiking, biking, and wildlife viewing (City of Mountain House 2025).

San Joaquin Council of Governments (SJCOG) oversees implementation and management of the San Joaquin County Multispecies Habitat Conservation and Open Space Plan (SJMSCP), which covers 97 special-status species including 25 species listed under the CESA and/or ESA. Although not directly protecting specific parcels of land, the SJMSCP covers activities impacting covered species and their habitats within San Joaquin County. The SJMSCP coverage area begins at the county line 3.2 miles east of the BSA and does not overlap with the proposed Project (SJCOG 2025).

5.2.1.3 Aquatic Resources

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and USGS National Hydrography Dataset (NHD) maps were reviewed to determine locations of mapped aquatic resources within the BSA (USFWS 2025a; USGS 2025a), The NWI identifies four Palustrine, Emergent, Persistent (PEM1) wetlands on the eastern portion of the study area, as shown in the ARDR in Appendix 5.2A. The NWI also identifies an unnamed drainage in the northwesternmost corner of the study area as Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC). The NHD identifies three ephemeral streams within the BSA, including one at the far northwesternmost corner of the study area, one in the center north portion of the study area, and one in the southeastern portion of the study area.

5.2.1.4 Special-Status Habitats and Critical Habitat

Special-status habitat types are natural vegetation communities listed by the CDFW California Natural Diversity Database (CNDDB) because of the rarity of the community in the state or throughout its entire range. The level of significance of a project's impact on a given sensitive natural community depends on that natural community's relative abundance. No CNDDB records for special-status habitat types are present within the BSA (CDFW 2025a).

Critical habitat is designated by the USFWS as essential for the conservation of a federally listed species. Federal or private action that may result in a take of a listed species, or destruction or adverse modification of designated critical habitat, requires consultation with the USFWS pursuant to Sections 7 or 10 of the ESA.

The entire BSA overlaps Critical Habitat Unit ALA-2 for California red-legged frog (USFWS 2025a, Figure 5.2-3). USFWS revised designated critical habitat for California red-legged frog in 2010 (USFWS 2010a). The USFWS defines the Physical and Biological Features of Critical Habitat (previously referred to as Primary Constituent Elements of Critical Habitat) as the essential characteristics of Critical Habitat that make the habitat suitable for fostering the recovery of the species, as defined in the ESA (USFWS 2010a).

Within the BSA, the stock pond in the eastern portion is considered suitable aquatic breeding habitat, and the wetlands within the BSA constitute aquatic nonbreeding habitat. Neither of these features are within the Project footprint; however, the nonnative annual grasslands within the BSA constitute suitable dispersal and upland habitat for California red-legged frog, as they provide suitable movement corridors between aquatic and upland habitats, as well as shelter and foraging opportunities for California red-legged frog individuals.

No other species have federally designated critical habitat within the BSA.

5.2.1.5 Special-Status Species

Literature and database reviews were conducted prior to field site visits to investigate the potential presence of sensitive resources, special-status species, and critical habitats within the BSA. This information is summarized in Appendix 5.2B. Information on resources in the BSA and a list of special-status plant and wildlife species with potential to occur in the BSA were developed by querying the following public databases and reference materials:

- The CNDDB was queried for occurrences of special-status species within 10 miles of the BSA (CDFW 2025b).
- The USFWS Information for Planning and Consultation (IPaC) database was queried to determine which federally listed species could potentially occur in the BSA (USFWS 2025b).
- The California Native Plant Society (CNPS) Rare Plant Inventory was queried for the Clifton Court Forebay USGS quadrangle and the following eight USGS quadrangles that directly surround the BSA: (1) Brentwood, (2) Woodward Island, (3) Holt, (4) Union Island, (5) Tracy, (6) Midway, (7) Altamont, and (8) Byron Hot Springs (CNPS 2025).
- The U.S. Fish and Wildlife Service NWI database and the USGS NHD were queried for information regarding aquatic resources and aquatic habitat (USFWS 2025a; USGS 2025).
- eBird database was queried for sightings and range maps for special-status bird species (eBird 2025).
- iNaturalist data were queried for research grade sightings and range maps for special-status wildlife and plant species (iNaturalist 2025).
- Aerial imagery was reviewed to examine aquatic resources and habitats for special-status species within and adjacent to the BSA (ESRI 2025)

For the purposes of this discussion, a plant or wildlife species was considered special status if it met one or more of the following criteria:

- Species listed as threatened, endangered, or candidate for listing under the ESA
- Species listed as threatened, endangered, candidate, or that have special requirements under the CESA
- Other species listed by CDFW as Fully Protected (FP), Species of Special Concern (SSC), or Watch List (WL) on CDFW's *Special Animals List* (CDFW 2025b)
- Species listed by the CNPS California Rare Plant Rank (CRPR) List 1 to 4 in its *Inventory of Rare and Endangered Plants of California* (CNPS 2025)

Special-status habitat types are natural vegetation communities listed by the CNDDB because of the rarity of the community in the state or throughout its entire range. The level of significance of a Project's impact on a given sensitive natural community depends on that natural community's relative abundance. A list of potential special-status species was assembled from these various resources. The species on this list were then evaluated to determine their potential to occur within the BSA.

The potential for special-status species to occur within the BSA was determined using the results of the desktop and literature review and field surveys completed to date. A species was determined to have potential to occur if there was a nearby CNDDB occurrence record (CDFW 2025b), if its known or expected

geographic range includes the BSA or the vicinity of the Project, and if its known or expected habitat is present within or near the BSA. Tables summarizing these species are included in Appendix 5.2B.

Jacobs biologists evaluated and ranked the potential for each special-status species to occur according to the following criteria:

- **Absent:** The species is not present in the BSA, either because it is outside the known range of the species, or because habitat in and adjacent to the BSA is unsuitable for the species' life history requirements (for example, foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, and disturbance regime). Alternately, protocol-level surveys, if conducted in sufficient rigor, did not detect the species with sufficient evidence to prove absence.
- **Low Potential**: Few of the habitat components meeting the species requirements are present, and the majority of habitat in and adjacent to the BSA is unsuitable or of marginal quality to support the species' life history requirements. The species is not likely to be found in the BSA. Either there are no recorded observations of species in the vicinity, or the records were historical. Protocol surveys, if fully conducted, did not detect species.
- **Moderate Potential**: Some of the habitat components meeting the species requirements are present, and only some of the habitat in or adjacent to the BSA is unsuitable. The species has a moderate probability of being found within the BSA. Recorded observations of this species are current (within the past 25 years), and it may be present in the vicinity.
- **High Potential**: The species is likely to occur within the BSA but has not been observed to date. The habitat components meeting the species requirements are present and most of the habitat in or adjacent to the BSA is highly suitable. The species has a high probability of being found within the BSA. Recorded observations of this species are current and present in the vicinity.
- **Present**: The species has been observed within the BSA or in the vicinity of the BSA during biological resource surveys with varying survey buffer sizes depending on the species.

5.2.1.6 Special-Status Plant Species

Based on the literature review, 51 special-status plant species were evaluated for their potential to occur in the BSA (Appendix 5.2B, Table 5.2B-1). Of the 51 species analyzed, 24 are not expected to occur in the BSA because of lack of suitable habitat or were not observed during protocol-level surveys as of May 2025; 9 species were identified as having low potential to occur in the BSA; 6 species were identified as having moderate potential to occur in the BSA; and 13 species were identified as having high potential to occur in the BSA. Table 5.2-2 lists special-status plant species that were identified as having moderate to high potential to occur in the BSA.

Table 5.2-2. Special-Status Plants with Moderate or High Potential to Occur within the BSA

Scientific Name	Common Name	Status[a]			Potential for Occurrence
		Federal	State	CNPS	
Androsace elongata ssp. *acuta*	California rockjasmine	-	-	4.2	High Potential
Astragalus tener var. *tener*	Alkali milk-vetch	-	-	1B.2	High Potential
Atriplex cordulata var. *cordulata*	Heartscale	-	-	1B.2	High Potential
Atriplex coronata var. *coronata*	Crownscale	-	-	4.2	High Potential
Atriplex depressa	Brittlescale	-	-	1B.2	High Potential
Atriplex minuscula	Lesser saltscale	-	-	1B.1	Moderate Potential

Scientific Name	Common Name	Status[a]			Potential for Occurrence
		Federal	State	CNPS	
Blepharizonia plumosa	Big tarplant	-	-	1B.1	High Potential
Centromadia parryi ssp. *congdonii*	Condgon's tarplant	-	-	1B.1	High Potential
Chloropyron molle ssp. *hispidum*	Hispid salty bird's-beak	-	-	1B.1	Moderate Potential
Chloropyron palmatum	Palmate-bracted bird's-beak	E	E	1B.1	Moderate Potential
Delphinium recurvatum	Recurved larkspur	-	-	1B.2	Moderate Potential
Eschscholzia rhombipetala	Diamond-petaled California poppy	-	-	1B.1	Moderate Potential
Extriplex joaquiniana	San Joaquin spearscale	-	-	1B.2	Moderate Potential
Fritillaria agrestis	Stinkbells	-	-	4.2	High Potential
Myosurus minimus ssp. *apus*	Little mouse tail	-	-	3.1	Moderate Potential
Navarretia nigelliformis ssp. *radians*	Shining navarretia	-	-	1B.2	Moderate Potential
Puccinellia simplex	California alkali grass	-	-	1B.2	Moderate Potential
Spergularia macrotheca var. *longistyla*	Long styled sand spurrey	-	-	1B.2	Moderate Potential
Tropidocarpum capparideum	Caper-fruited tropidocarpum	-	-	1B.1	High Potential

Notes:

[a] Status abbreviations:

- = not listed

CNPS = California Native Plant Society

E = Endangered

CRPR Designations:

1A = presumed extirpated or extinct because they have not been seen or collected in the wild in California for many years

1B = rare throughout their range with the majority of them endemic to California

2A = presumed extirpated because they have not been observed or documented in California for many years

2B = Except for being common beyond the boundaries of California, plants with a California Rare Plant Rank of 2B would have been ranked 1B

3 = lack the necessary information to assign them to one of the other ranks or to reject them

4 = limited distribution or infrequent throughout a broader area in California

Special-status plant species with moderate or high potential to occur are listed in the following subsections.

Special-Status Grassland Plant Species

Nonnative annual grasslands within the BSA and the footprint of the BESS provide moderate to high potentially suitable habitat for the following species (Appendix 5.2B, Table 5.2B-1):

- big tarplant
- California rockjasmine
- caper-fruited tropidocarpum
- Congdon's tarplant
- diamond-petaled poppy
- recurved larkspur
- stinkbells

Rare plant surveys, currently in progress, will be completed to determine whether these species are present within the BSA.

Special-Status Plant Species Associated with Seasonal Wetlands

Emergent wetland habitats and surrounding marginal areas within the BSA provide potentially suitable habitat for the following species (Appendix 5.2B, Table 5.2B-1):

- alkali milk-vetch
- brittlescale
- California alkali grass
- crownscale
- heartscale
- hispid salty bird's-beak
- lesser saltscale
- little mouse tail
- long-styled sand-spurrey
- palmate-bracted bird's-beak
- San Joaquin spearscale
- shining navarretia

Because these species are considered to have moderate to high potential to occur, rare plant surveys, currently in progress, will be completed to determine whether these species are present within the BSA.

5.2.1.7 Special-Status Wildlife Species

The BSA contains habitat that may support special-status wildlife species. The literature review indicated a total of 46 special-status wildlife species that may be regionally present and were assessed for their potential to occur in the BSA (Appendix 5.2B, Table 5.2B-2). Of the 46 species analyzed, 16 are not expected to occur in the BSA because of lack of suitable habitat. Nine species were identified as having low potential to occur in the BSA; three species were identified as having moderate potential to occur in the BSA; three species were identified as having high potential to occur in the BSA; and 15 species were observed or otherwise known to be present in the BSA. The 30 special-status wildlife species identified as having the potential to occur in the BSA are included in Appendix 5.2B, Table 5.2B-2, and are also summarized in Table 5.2-3.

Table 5.2-3. Special-Status Wildlife with Potential to Occur within the BSA

Class	Scientific Name	Common Name	Status[a]			Potential For Occurrence
			Federal	State	CDFW	
Invertebrate	*Bombus crotchii*	Crotch's bumble bee	-	CE	-	Low Potential
Invertebrate	*Danaus plexippus*	Monarch butterfly	C	-	-	Low Potential
Amphibian	*Ambystoma californiense*	California tiger salamander - Central California DPS Population 1	T	T	WL	Present. Highly suitable upland habitat with suitable burrows is present within the BSA. Suitable breeding habitat within known migratory distances for the species is also present in the form of ephemeral pools and stock ponds. This species has been incidentally observed by Jacobs biologists breeding 0.75 mile south of the BSA. There are 218 CNDDB occurrences within 10 miles of the BSA, with the closest occurrence located approximately 0.12 mile west of the BSA (CDFW 2025b).
Amphibian	*Rana draytonii*	California red-legged frog	T	-	SSC	Present. The BSA provides highly suitable upland dispersal habitat and aquatic non-breeding habitat. The pond within the BSA does not contain suitable emergent vegetation to be considered breeding habitat. This species has been incidentally observed by Jacobs biologists breeding 0.75 miles south of the BSA, and adults were observed incidentally by Jacobs biologists 0.2 mile west of the Project. There are 212 CNDDB occurrences within 10 miles of the BSA, with the closest occurrence located approximately 0.12 mile west of the BSA (CDFW 2025b).
Amphibian	Critical habitat, *Rana draytonii*	Critical habitat, California red-legged frog	T	-	SSC	Present. The BSA is entirely within critical habitat for California red-legged frog and contains suitable upland dispersal and aquatic non-breeding habitat. (Unit ALA-2).
Amphibian	*Spea hammondi*	Western spadefoot	FPT	-	SSC	High Potential. The BSA is within the species' known range and suitable upland and breeding habitat is present. There are 5 CNDDB occurrences within 10 miles of the BSA, the closest being 6.1 miles south of the BSA (CDFW 2025b).
Reptile	*Actinemys marmorata*	Northwestern pond turtle	FPT	-	SSC	High Potential. Suitable upland nesting habitat is present in the BSA. Five adult western pond turtles were incidentally observed by Jacobs biologists in a nearby pond 0.3 mile to the northeast in April 2025, adjacent to Bethany Reservoir, during spring Swainson's hawk surveys for the Project.
Reptile	*Arizona elegans occidentalis*	California glossy snake	-	-	SSC	Moderate Potential

Class	Scientific Name	Common Name	Status[a]			Potential For Occurrence
			Federal	State	CDFW	
Reptile	*Masticophis flagellum ruddocki*	San Joaquin coachwhip	-	-	SSC	Moderate Potential
Reptile	*Phyrnosoma blainvilli*	Blainville's (= Coast) horned lizard	-	-	SSC	Low Potential
Bird	*Accipiter cooperii*	Cooper's hawk	-	-	WL	Low Potential
Bird	*Agelaius tricolor*	Tricolored blackbird	-	T	SSC	Present. A flock of 200 tricolored blackbird was observed foraging in the BSA during 2025 wildlife surveys. There are 20 CNDDB occurrences within 10 miles of the BSA (CDFW 2025b). Suitable foraging habitat is present within the BSA. The BSA does not contain high quality nesting habitat for this species, and nesting is not expected.
Bird	*Ammodramus savannarum*	Grasshopper sparrow	-	-	SSC	High Potential. Suitable habitat is present throughout the BSA. There is one CNDDB occurrence of this species within 10 miles of the BSA, approximately 6.4 miles southeast of the BSA (CDFW 2025b).
Bird	*Aquila chrysaetos*	Golden eagle	-	-	FP	Present. Species is known to occur in the APWRA and species was observed soaring over the BSA during 2024 and 2025 surveys; suitable foraging habitat is present within the BSA. No suitable nesting habitat is present in the BSA, but golden eagles are known to nest within 1 mile of planned activities.
Bird	*Asio flammeus*	Short-eared owl	-	-	SSC	Present. The BSA contains suitable foraging and nesting habitat. This species was observed approximately 0.95 mile east in 2023 during biological surveys on a neighboring parcel. There is one CNDDB occurrence within 10 miles of the BSA, approximately 7 miles southeast of the BSA (CDFW 2025b).
Bird	*Athene cunicularia hypugaea*	Burrowing owl	-	C	SSC	Present. Suitable grassland habitat is present and this species was observed in the BSA during 2024 and 2025 surveys.
Bird	*Buteo regalis*	Ferruginous hawk	-	-	WL	Present. Species has been observed in the BSA during 2024 and 2025 surveys but is only present in the region during the winter nonbreeding season.

Class	Scientific Name	Common Name	Status[a]			Potential For Occurrence
			Federal	State	CDFW	
Bird	*Buteo swainsoni*	Swainson's hawk	-	T	-	Present. Suitable foraging habitat is present within the BSA, and suitable nesting habitat is present within 0.5 mile of the BSA. There are 49 CNDDB occurrences within 10 miles of the BSA, with the closest occurrence located approximately 1.25 miles northwest of the BSA (CDFW 2025b). This species was observed soaring over the BSA during 2025 surveys.
Bird	*Circus hudsonius*	Northern harrier	-	-	SSC	Present. Species was observed in the BSA during 2024 and 2025 surveys; suitable nesting and foraging habitat is present in annual grasslands throughout the BSA.
Bird	*Elanus leucurus*	White-tailed kite	-	-	FP	High Potential. Species is known to occur in the APWRA; suitable nesting habitat is limited to a few eucalyptus trees in close proximity to the BSA; species could forage in nonnative annual grassland throughout the BSA. The nearest documented nest is 1.78 miles northeast of the BSA (CDFW 2025b).
Bird	*Eremophila alpestris actia*	California horned lark	-	-	WL	Present. This species has been observed in the BSA during 2024 and 2025 surveys. Suitable nesting habitat is present throughout the BSA.
Bird	*Falco mexicanus*	Prairie falcon	-	-	WL	Present. This species was observed during 2024 and 2025 surveys. Suitable foraging habitat is present in the BSA, but nesting habitat is absent.
Bird	*Falco peregrinus anatum*	American peregrine falcon	Delisted	Delisted	FP	Low Potential
Bird	*Gymnogyps californianus*	California condor	E	E	FP	Low Potential
Bird	*Haliaeetus leucocephalus*	Bald eagle	Delisted	E	FP	Present. Species winters in the APWRA and may forage near the BSA at Bethany Reservoir approximately 0.5 mile east; however, no suitable nesting or high-quality foraging habitat (large lakes, reservoirs, or rivers) is present in the BSA. Evidence of potential nesting within 1 mile of the BSA is very little, but potential nesting substrates, such as large eucalyptus trees and high-voltage power line towers, exist within 1 mile of the BSA. A pair of bald eagles was observed soaring over the BSA during 2024 and 2025 surveys. Bald eagle copulation was observed near the BSA during spring 2025 surveys.

Class	Scientific Name	Common Name	Status[a]			Potential For Occurrence
			Federal	State	CDFW	
Bird	*Lanius ludovicianus*	Loggerhead shrike	-	-	SSC	Present. Suitable foraging habitat is present, and this species was observed within BSA during 2025 surveys. Nesting is unlikely to occur within the BSA, as dense thickets of brush and trees are absent.
Bird	*Melospiza melodia pop. 1*	Song sparrow (Modesto population)	-	-	SSC	Moderate Potential
Mammal	*Antrozous pallidus*	Pallid bat	-	-	SSC	Low Potential
Mammal	*Corynorhinus townsendii*	Townsend's big-eared bat	-	-	SSC	Low Potential
Mammal	*Taxidea taxus*	American badger	-	-	SSC	Presumed Present. Suitable habitat is present throughout the BSA. Jacobs biologists observed one adult badger at a den incidentally on April 8, 2025, 0.13 mile northeast of the BSA during spring burrowing owl surveys that were conducted within 547 yards of the Project footprint. Badger digging sign has been observed within the BSA.
Mammal	*Vulpes macrotis mutica*	San Joaquin kit fox	E	T	-	Low Potential

[a] Status abbreviations:
- = not listed
C = Candidate
CE = Candidate Endangered
Delisted =
E = Endangered
FP = Fully Protected
FPT = Federally Proposed Threatened
ppt = parts per thousand
SSC = CDFW Species of Special Concern
T = Threatened
WL = Watch List

The species with potential to occur or incidentally observed in the BSA are discussed in the following sections. Wildlife species that were observed during the botanical and wildlife surveys are provided in Appendix 5.2C.

Invertebrates

Crotch's Bumble Bee

The Crotch's bumble bee was once the predominant pollinator in northern California's Central Valley, but now appears to be largely absent from it, especially in the center of its historic range (Hatfield et al. 2014). Crotch's bumble bee nest underground in scrub grassland habitats (Williams et al. 2014). Crotch's bumble bee is considered to be a generalist forager with individuals foraging at sages (*Salvia* spp.), lupines (*Lupinus* spp.), medics (*Medicago* spp.), phacelias (*Phacelia* spp.), and milkweeds (*Asclepias* spp.; Hatfield et al. 2018). Little is known about the overwintering sites or hibernacula of this species; however, it is reported that Crotch's bumble bee generally overwinter under debris or litter piles in soft, disturbed soils (Williams et al. 2014). Focused surveys for bumble bees, including Crotch's bumble bee, have not been conducted; however, a habitat assessment conducted concurrently with botanical surveys are under way.

Although suitable nesting sites for this species, in the form of abandoned rodent burrows, are ubiquitous in the BSA, floral resources for foraging are limited, making the overall likelihood of nesting low. In addition, high winds in the region further reduce the likelihood of Crotch's bumble bee presence, as high winds would make dispersal and nectaring during foraging bouts difficult. However, the potential for Crotch's bumble bee foraging and nesting cannot be ruled out completely, as survey data are lacking and suitable habitat is present, despite the quality of habitat being marginal.

Based on the limited occurrence data and marginally suitable habitat present in the BSA for nesting and foraging, there is a low potential for Crotch's bumble bee to be present foraging or nesting in the BSA (Appendix 5.2B, Table 5.2B-2); however, a habitat assessment is under way, and updated information will be provided at a later date.

Monarch Butterfly

Monarch butterfly was federally proposed for listing as threatened in December 2024 (final decision to be made in December 2025).

Monarch butterflies are considered to have a low potential to occur within the BSA. In early spring, the western population of Monarchs travels from overwintering sites in Mexico and along the California coast to breeding ranges in California, Nevada, Oregon, Washington, Arizona, and Idaho; with the onset of fall, the newest generations of monarchs make the journey back to their overwintering sites (Xerces Society 2018). Within California, Monarch butterflies use overwintering sites along the Pacific coast. Adult monarchs are generalists and feed on the nectar of a variety of flowering plants, although the species requires milkweed (*Asclepias* spp.) as a larval host plant for reproduction (Xerces Society 2018).

Larval host plant surveys were not yet conducted, but narrow leaf milk weed (*Asclepias fascicularis*) was observed within the BSA during rare plant and habitat surveys to date. Suitable roosting habitat or overwintering habitat is absent from the BSA and regional vicinity. Floral resources for foraging are limited in the BSA, making the overall likelihood of Monarch butterfly presence low. In addition, high winds in the region further reduce the likelihood of Monarch butterfly presence, as high winds would make dispersal and nectaring during foraging bouts difficult. However, the presence of this species cannot be ruled out, as floral resources, including a larval host plant species, are present in the BSA.

Based on the limited occurrence data, lack of roosting or overwintering habitat, limited floral resources, and high winds in the BSA, there is a low potential for Monarch butterflies to be present in the BSA (Appendix 5.2B, Table 5.2B-2). However, surveys are under way, and updated information will be provided at a later date.

Amphibians

California Red-Legged Frog

The California red-legged frog requires aquatic breeding habitat that hold water for a minimum of 20 weeks in all but the driest of years (USFWS 2010a), as well as nearby upland habitat for refugia, foraging, and dispersal. It is found in a broad range of ecological settings, from coastal dunes and estuaries to riparian areas at desert margins (Hansen and Shedd 2025). The BSA is located entirely within designated critical habitat for California red-legged frog (Unit ALA-2), Jacobs biologists have incidentally observed this species breeding in a stock pond 0.75 mile south of the BSA and inhabiting a stock pond 0.2 mile west of the BSA. Neither stock pond is located within the Project footprint.

The stock pond in the BSA provides suitable aquatic breeding habitat, and wetlands in the BSA provide aquatic nonbreeding habitat for frogs in the Project vicinity. Jacobs biologists did not observe any California red-legged frogs in the ponds or wetlands within the BSA during surveys; however, because California red-legged frogs are known to have a maximum dispersal distance of 2 miles (Bulger et al. 2003), aquatic habitat in the BSA could be colonized by dispersing frogs traveling from nearby breeding grounds in ponded sections of creeks and stock ponds in the vicinity of the Project. Because of this, upland areas in the BSA represent suitable upland and dispersal habitat for this species. Upland areas within the BSA contain small mammal burrows or deep soil cracks that may be used by this species as refugia.

Based on the presence of suitable breeding and upland habitat within the BSA and numerous potential and known breeding sites within 2 miles of the BSA, California red-legged frog is known to be present in the BSA (Appendix 5.2B, Table 5.2B-2).

California Tiger Salamander

The California tiger salamander is found in California's grasslands, often on gently rolling terrain underlain by clay soils that support the formation of vernal pools in the rainy season (Hansen and Shedd 2025). It requires aquatic breeding habitat with nearby upland with mammal burrows. Jacobs biologists have incidentally observed this species breeding in a stock pond 0.75 mile south of the BSA; however, the stock pond is not located within the Project footprint.

The stock pond in the BSA provides suitable aquatic breeding habitat. Additionally, other stock ponds are scattered throughout the Project vicinity that provide suitable breeding habitat. Because California tiger salamanders are known to breed near (within approximately 1.25 miles) the BSA, they could occupy small mammal burrows or deep soil cracks in nonnative annual grasslands that serve as upland habitat throughout the BSA.

Based on the presence of suitable upland and aquatic breeding habitat in the BSA and known occupancy in the Project vicinity, California tiger salamander is known to be present in the BSA (Appendix 5.2B, Table 5.2B-2).

Western Spadefoot

The Western spadefoot is primarily found in open landscapes such as the grassland vernal pool ecosystems, desert scrub, and coastal sage scrub, but is also found in chaparral or oak woodland (Hansen and Shedd 2025). It is remarkably flexible in its aquatic breeding habitat requirements and breeding timing. The BSA is within the known range of Western spadefoot.

Suitable breeding habitat for Western spadefoot exists within the pond and wetlands in the BSA. If Western spadefoot breed in the BSA, they could occupy small mammal burrows or soil cracks within the BSA. However, the stock pond and the wetlands are not within the Project footprint.

Based on the presence of suitable breeding and upland habitat within the BSA, there is a high potential for Western spadefoot to be present in the BSA (Appendix 5.2B, Table 5.2B-2).

Reptiles

Northwestern Pond Turtle

The Northwestern pond turtle is found in a variety of permanent and intermittent waters including streams, creeks, ponds, lakes, sloughs, marshes, and human created impoundments such as wastewater treatment ponds (Hansen and Shedd 2025). It may also be found in seasonal creeks that by midsummer are reduced to a series of pools or even dry out entirely. Jacobs biologists incidentally observed five adult turtles in a stock pond 0.3 mile northeast of the BSA with hydrological connectivity to the stock pond in the BSA in April of 2025; however, neither stock pond is within the Project footprint.

The stock pond in the BSA provides suitable aquatic habitat for Northwestern pond turtle. Northwestern pond turtles may also nest or disperse through the nonnative annual grassland habitat within the BSA but would mostly be expected to bask in and around the stock pond. Although this species is known to be present near the BSA, it is not expected to be encountered within the upland areas of the Project footprint except on very rare occasions (for example, nesting or overland dispersal events) because it is a highly aquatic species.

Because of the known presence of this species in the regional vicinity and suitable aquatic and upland nesting habitat in the BSA, there is high potential for the species to occur within the BSA (Appendix 5.2B, Table 5.2B-2).

Other Special-Status Reptiles, Including Blainville's Horned Lizard, California Glossy Snake, and San Joaquin Coachwhip

These three special-status reptile species, Blainville's horned lizard, California glossy snake, and San Joaquin coachwhip, are combined due to their shared habitat requirements.

The Blainville's horned lizard is typically found in open grasslands, chaparral, and coastal sage scrub vegetation communities with friable sandy soils or rodent burrows (Hansen and Shedd 2025). Although occurrences are closer and more numerous than the two aforementioned species, the potential for Blainville's horned lizard to occur in the BSA is considered low as recent range maps show the BSA is just outside of their known extant range (Hansen and Shedd 2025).

The California glossy snake is found mostly on sandy substrates in coastal sagebrush and grassland communities, as well as a variety of habitat types in the Mojave and Colorado deserts (Hansen and Shedd 2025). This subspecies of the glossy snake is found in western and southern San Joaquin Valley, south to the US-Mexico border; the BSA is entirely within the species' known extant range (Hansen and Shedd 2025).

The San Joaquin coachwhip is found in arid habitats, especially in desert washes and arroyos with plentiful lizard prey species, but it is also encountered in arid grassland and riparian areas (Hansen and Shedd 2025). The BSA is entirely within the species' known extant range (Hansen and Shedd 2025).

Nonnative annual grasslands within the BSA provide suitable habitat for all three species. Microhabitat conditions suitable for each species are also present in the BSA in the form of friable soils and basking areas, such as rock outcrops and rock piles, with large insect prey bases for Blainville's horned lizard, and small mammal burrows and deep soil cracks for San Joaquin coachwhip and California glossy snake oviposition. These species are uncommon within the Altamont but may potentially use nonnative annual grassland in the Project footprint for all stages of their life cycles.

Based on the presence of suitable habitat in the BSA but the BSA being just outside of the known extant range for this species, the potential for Blainville's horned lizard to occur within the BSA is considered low (Appendix 5.2B, Table 5.2B-2). Based on the presence of suitable habitat in the BSA and their ranges overlapping with the BSA, the potential for California glossy snake and San Joaquin coachwhip to occur within the BSA is considered moderate (Appendix 5.2B, Table 5.2B-2).

Birds

Burrowing Owl

Burrowing owls require open, arid, habitats covered by low-stature vegetation, such as grasslands, prairies, shrub steppes, and desert shrubs (Center for Biological Diversity et al. 2024). Small mammal burrows, typically dug by California ground squirrel (*Otospermophilus beecheyi*) throughout most of the state, are also a required part of its habitat.

Burrowing owls are known to be present in high densities within the BSA; for example, ten burrowing owl adults were observed within the BSA during protocol-level nonbreeding season surveys in December 2024 (Appendix 5.2B, Table 5.2B-2).

Special-Status Grassland-Nesting Birds, Including California Horned Lark, Grasshopper Sparrow, Northern Harrier, and Short-Eared Owl

All these special-status bird species nest on the ground in grasslands:

- California horned larks
- grasshopper sparrows
- northern harriers
- short-eared owls

California horned larks are a subspecies of the horned lark, and are found in open habitats including grasslands, mountain meadows, open coastal plains, fallow grain fields, alkali flats (CDFW 2025b). Grasshopper sparrows are considered to have a high potential to occur within the BSA. This species is found in grassland habitats, preferring native grasslands with a mix of grasses, forbs, and scattered shrubs (CDFW 2025b). Northern harriers are most often found in marshy areas (CDFW 2025b). Short-eared owls are found in a variety of open habitats including grasslands, marshes, lowland meadows, and irrigated alfalfa fields (CDFW 2025b). California horned larks and Northern harriers were observed consistently within the BSA during biological resource surveys., and a short-eared owl was observed incidentally by Jacobs biologists 0.95 mile east during 2023 surveys on a neighboring parcel.

All four of these species could nest in nonnative annual grassland habitat throughout the BSA; these grasslands also provide suitable foraging habitat for these species. Based on observations of these species within and near the BSA, northern harrier, short-eared owl, and California horned lark are considered present, foraging and potentially nesting in the BSA (Appendix 5.2B, Table 5.2B-2). Based on the presence of suitable nonnative annual grassland habitat and known occurrences in proximity to the BSA, grasshopper sparrow is considered to have high potential to nest and forage in the BSA (Appendix 5.2B, Table 5.2B-2).

Tricolored Blackbird

Tricolored blackbirds inhabit a variety of wetland and upland habitats, requiring open water, protected nesting substrate, and foraging areas with insect prey (CDFW 2025b). They are highly colonial and have been reported to breed in groups exceeding 100,000 nests (Shuford and Gardali 2008).

The BSA supports little to no nesting habitat; most stock ponds in the vicinity are denuded of any suitable emergent or wetland vegetation (for example, tules [*Schoenoplectus acutus*] or cattails [*Typha* spp.]) by the ongoing cattle grazing, and the few patches of blackberries (*Rubus* spp.) or dense thistle (*Asteraceae* sp.) patches in the BSA are relatively small in extent. The BSA does, however, provide abundant grassland foraging habitat for tricolored blackbird. The areas fringing Bethany Reservoir feature suitable vegetation that could provide nesting habitat for tricolored blackbird but are far enough away from the BSA to not pose a risk of disturbance to nesting colonies.

Based on observations of this species in the BSA, tricolored blackbird is expected to be present foraging within the BSA but is unlikely to nest within the BSA (Appendix 5.2B, Table 5.2B-2).

Loggerhead Shrike

Loggerhead shrikes are found in a variety of open habitats including scattered woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub, and washes (CDFW 2025b). It may also be found in grassland habitats with some shrubby patches present. Loggerhead shrikes could forage throughout the nonnative annual grassland in the BSA, as abundant prey species, such as lizards, grasshoppers, and other large insects, are present. Although the BSA generally lacks suitable nesting substrate for this species, tumbleweeds and other vegetation could get caught in the substation fence or surrounding parcel fence, inadvertently creating nesting substrates. Nesting habitats are present in trees and shrubby vegetation near the BSA.

Based on the presence of known nesting habitat in the vicinity of the BSA and ubiquitous foraging habitat throughout the BSA, loggerhead shrike is considered to have a high potential to forage within and nest within or near the BSA (Appendix 5.2B, Table 5.2B-2).

Golden Eagle

Golden eagles are found in a variety of habitats, including rolling foothills, mountainous areas, sage-juniper flats, and desert (CDFW 2025b). It requires cliff-walled canyons or large trees in open areas for nesting. The APWRA is a high-density golden eagle nesting area, and this species has been observed foraging in the BSA during multiple biological resource surveys. High-quality foraging and nesting habitat for this species is present within 1 mile of the BSA, although nesting substrates are limited within this area (Appendix 5.2B, Table 5.2B-2). The eucalyptus trees immediately southwest of the BSA are considered suitable nesting habitat, but routine presence of windfarm personnel on this parcel and proximity to regularly maintained windfarm infrastructure reduces nesting habitat quality. This species is known to nest at a density greater than the CNDDB indicates within the region, as nest sites are often located on privately owned parcels within valleys hidden from public view.

Bald Eagle

Bald eagle is known to winter in the APWRA and forage near the BSA at Bethany Reservoir approximately 0.5 mile east; however, no suitable nesting or high-quality foraging habitat (large lakes, reservoirs, or rivers) is present in the BSA. Evidence of potential nesting within 1 mile of the BSA is low, but potential nesting substrates, such as large eucalyptus trees and high-voltage power line towers, exist within 1 mile of the BSA (Appendix 5.2B, Table 5.2B-2).

White-Tailed Kite

White-tailed kite is found in a variety of open habitats including grasslands, meadows, or marshes (CDFW 2025b). It requires isolated, dense-topped trees for nesting and perching. Suitable nesting habitat for white-tailed kite is present in the form of a stand of eucalyptus trees southwest of the BSA. But within potential disturbance distance from construction in the Project footprint. Nonnative annual grassland in the BSA provides abundant prey for raptors, including small lizards, mice, voles, ground squirrels, and other small vertebrate species.

Based on nearby occurrences, the presence of suitable nesting habitat near the BSA, and suitable foraging habitat within the BSA, white-tailed kites are considered to have a moderate potential to occur within the BSA (Appendix 5.2B, Table 5.2B-2).

Swainson's Hawk

Swainson's hawks require open habitats such as grassland for foraging and nests in trees, often nesting peripherally to riparian systems of the valley as well as using lone trees or groves of trees in agricultural fields (Bechard et al. 2020, Furnas et al. 2022). The Swainson's hawk breeds in the western U.S. and Canada, and winters in South America as far south as Argentina (Bechard et al. 2020). In California, most breeding occurs in the Central Valley between Modesto and Sacramento, and approximately 89% of

breeding pairs now occur within 18 miles of the Central Valley (Battistone et al. 2022). The BSA sits on the western fringe of Swainson's hawk nesting range (Appendix 5.2B, Table 5.2B-2).

Other Native Nesting Birds

A wide variety of protected native bird species are present within the BSA, for example see the list of species observed in Appendix 5.2C. Ferruginous hawk, peregrine falcon, prairie falcon, song sparrow, and other nesting bird species, though not discussed individually in this section, may be present during Project construction and operations. Almost all birds are protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (FGC) Section 3503. Additionally, bird species designated as SSC also are protected under Title 14, California Code of Regulations (Sections 670.2 and 670.5). Raptors are protected under various federal and state codes, including the MBTA, and FGC Sections 3503, 3503.5, and 3513.

Mammals

American Badger

American badgers are found in a variety of habitats, preferring drier open areas of most shrub, forest, and herbaceous habitats, with friable soils (CDFW 2025b). The nonnative annual grassland habitat in the BSA provides suitable denning, foraging, and dispersal habitat for this species, with abundant prey of small mammals, and burrows created by fossorial mammals suitable for converting into badger dens.

Based on observations of this species near the BSA, American badgers are presumed to be present in the BSA (Appendix 5.2B, Table 5.2B-2).

San Joaquin Kit Fox

San Joaquin kit fox occurs in a variety of habitats but prefers grasslands with scattered shrubs. This species may also occur in agricultural areas and in urban areas as long as there are dispersal corridors to suitable denning and foraging sites. San Joaquin kit fox appear to have adapted to living in marginal areas such as grazed, non-irrigated grasslands; peripheral lands adjacent to tilled and fallow fields; irrigated row crops, orchards, and vineyards; and petroleum fields and urban areas (USFWS 1998). They typically prefer low-relief areas (USFWS 2010b). Suitable denning, foraging, and dispersal habitat is present in nonnative annual grassland throughout the BSA, and many burrows sufficiently sized for kit fox are present. The nonnative annual grassland habitat in the BSA provides suitable denning, foraging, and dispersal habitat for this species, with abundant prey of small mammals, and burrows created by fossorial mammals suitable for converting into kit fox dens. Due to the presence of nonnative annual grassland habitat and burrow complexes, dispersing San Joaquin kit foxes could travel through or den in the BSA; however, the potential for San Joaquin kit fox to occur in the BSA is low because the species has not been detected in the Project vicinity in 25 years, despite the large amount of occurrence data in the vicinity of the BSA (Appendix 5.2B, Table 5.2B-2).

Special-Status Bats

These species are combined due to their shared life history strategies including their requirements for "cave-type" structures for roosting, their ability to fly, and their insectivorous diet.

Townsend's big-eared bat and pallid bat are considered to have low potential to occur in the BSA. These species are all considered to be "cave-hibernating bats," comprising species that undergo torpor and overwinter in caves, mines, and other sheltered areas that have low but stable temperatures (AWWI 2018). Townsend's big-eared bat and pallid bat are found in a variety of open habitats with rocky areas for roosting, including deserts, grasslands, shrublands, woodlands and forests (CDFW 2025b). Most North American bat species are insectivorous, typically using echolocation to find and capture flying insect prey (AWWI 2018).

Potential habitats within the BSA, including human-made structures within the existing substation, lack suitable roosting habitat, as determined during the November 2024 preliminary bat habitat assessment. However, dilapidated farm structures are ubiquitous throughout the regional vicinity and may provide suitable roosting habitat for bat species. Roosting bats in the vicinity of the BSA may migrate or forage through the BSA. Substantial populations of suitable insect prey species are present in the BSA and regional vicinity.

Based on the limited occurrence data and lack of suitable roosting habitat in the BSA, bat species are considered to have low potential to forage in the BSA (Appendix 5.2B, Table 5.2B-2).

5.2.1.8 Biological Survey

The Applicant's biologists and botanists have conducted the following surveys:

- Reconnaissance-level wildlife survey and initial habitat assessment
- Protocol-level burrowing owl surveys: winter and spring surveys
- Tricolored blackbird habitat assessment
- Protocol-level Swainson's hawk surveys
- Focused eagle nesting surveys
- Aquatic resource delineation (Appendix 5.2A)

The following biological resource surveys are in progress and findings will be provided upon completion of the surveys:

- Protocol-level botanical surveys, including vegetation mapping and floral composition, in the BSA
- Protocol-level burrowing owl surveys, summer and fall surveys

Table 5.2-2 provides the dates, biologists, and description of surveys conducted by Jacobs biologists, botanists, or subconsultants to support the Project.

Table 5.2-4. Biological Survey and Aquatic Resource Delineation Field Work Completed to Date

Dates	Personnel	Survey Type
November 7, 2024	Brian Lee, Scott Lindemann, Kyle Brown, Sean O'Neil	Reconnaissance-level wildlife survey, reconnaissance-level habitat assessment survey, and preliminary bat habitat assessment
December 11, 2024	Scott Lindemann and Sean O'Neil	Protocol-level non-breeding season burrowing owl survey
February 25 and 26, 2025	Kyle Brown and Greg Davis	Protocol-level botanical surveys, land cover mapping, and invasive plant surveys
March 18, 2025	Pim Laulikitnont-Lee and Greg Davis	Aquatic resources delineation
March 20 and 27, and April 3, 14, 16, and 18, 2025	Scott Lindemann, Sean O'Neil, Sunny Lee, Rachel Cotroneo, and Samuel Wentworth	Six protocol-level Swainson's hawk surveys, and concurrent focused eagle surveys
April 3, 2025	Sam Young and Greg Davis	Protocol-level botanical surveys, land cover mapping, and invasive plant surveys
April 8, 2025	Scott Lindemann, Sean O'Neil, and Holly Barbare	Protocol-level breeding season burrowing owl survey, tricolored blackbird habitat assessment

Dates	Personnel	Survey Type
May 14, 2025	Scott Lindemann, Sean O'Neil	Protocol-level breeding season burrowing owl survey
May 16, 2025	Sam Young and Greg Davis	Protocol-level botanical surveys, land cover mapping verification, and invasive plant surveys

5.2.1.9 Methods

This section describes the methods used to assess biological resources within the BSA and vicinity. Aside from the BSA, a 500-foot buffer around Project components, additional survey areas were used for some species as required by their protocol survey methods: for Swainson's hawk, a 0.5-mile buffer of the Project footprint was used; for burrowing owl, a 547-yard buffer was used; and for eagles, a 2-mile buffer was used.

Protocol-Level Botanical Surveys

Botanical survey methods were floristic in nature and followed CDFW (CDFW 2018) and USFWS protocols (USFWS 1996). All taxa were identified to the taxonomic level necessary to determine whether they are a special-status plant species. Common plant names were taken from the *Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California* (Jepson Flora Project 2025). Common plant names not provided in the Jepson eFlora list were taken from Calflora (2025).

Jacobs botanists conducted the first series of botanical surveys in the BSA (Table 5.2-4). The botanists have extensive experience identifying botanical resources in California, with emphasis on resources in the Altamont Region, San Francisco Bay Area, and the Central Valley. Surveys will continue throughout 2025 during the periods of identifiable phenology for potentially occurring special-status plant species. Botanists visited special-status plant reference site populations for species with high potential to occur to confirm that the surveys were conducted at a time of year when species would be apparent and identifiable (CDFW 2018; USFWS 1996).

Data were recorded digitally and on hard copy in field notebooks. Digital data were collected on iOS devices with the Collector application on the ArcGIS Online platform, with 9.8-footr accuracy. Botanists conducted pedestrian surveys of potentially suitable habitat for special-status plants.

Invasive Plant Surveys

Invasive plant species pose a risk to native plants and wildlife through competitive exclusion, changes to habitat structure, cascading food web effects, changes to runoff and soil erosion, changes to soil chemistry and nutrient availability and toxicity. Invasive plant species were documented concurrently with the botanical surveys. For purposes of this survey, invasive plant species are those ranked as moderate or high by the California Invasive Plant Council (Cal-IPC 2025). Invasive plant species are tracked and ranked by threat to natural communities by the Cal-IPC. The list of potential target invasive plants does not include the invasive grass species that dominate both the project area and entire region, and other widespread plants. Invasive species ranked moderate or high (excluding exotic annual grasses, black mustard [*Brassica nigra*], and shortpod mustard [*Hirschfeldia incana*]) are in the process of being mapped for baseline cover, which will be used as a benchmark for restoring temporary impact areas. Target invasive plant species localities are being documented digitally and on hard copy datasheets, using the same methods described earlier for the botanical surveys. Localities are defined as locations where one or more individuals were detected.

Land Cover Mapping

Land cover was assessed in GIS using areal imagery and was verified in the field during surveys, using California Wildlife Habitat Relationships (CWHR) classifications (CDFG 2005), and retaining consistency with other survey analyses like the ARDR. There are four land cover types preliminarily identified in the BSA:

- Nonnative Annual Grassland – Nonnative annual grasses are the dominant species including wild oats (*Avena spp.)*, Bromes (*Bromus* spp.), Fescues (*Festuca* spp.), and Barleys (*Hordeum* spp.). Common forbs include filaree (*Erodium* spp.), California poppy (*Eschscholzia californica*), and clovers (*Trifolium* spp.) (CDFG 2005).
- Emergent Wetland – Dominated by hydrophytes. In alkaline soils, this is often salt grass (*Distichilis spicata*) (CDFG 2005). However, salt grass presence does not necessarily indicate alkaline soils.
- Pond/Open Water
- Developed/Disturbed/Barren

Detailed vegetation sampling is under way to map land cover following the Manual of California Vegetation during rare plant surveys, and will be provided following completion of surveys (CNPS 2025b).

Wildlife Surveys

Reconnaissance-Level Wildlife Survey and Initial Habitat Assessment

Jacobs biologists conducted a reconnaissance-level wildlife survey and habitat assessment of the BSA to assess the BSA for habitat for special-status species, including potential bat roosting habitat (Table 5.2-4). Biologists recorded all wildlife observations and wildlife sign (such as burrows, tracks, scat, carcasses, and vocalizations). The Merlin bird song app was also used (Cornell Lab of Ornithology 2025). Initial vegetation community and land cover mapping was included with this survey, supported by GIS areal imagery interpretation, and verified with observations from subsequent botanical surveys described above, and an aquatic resource delineation, described in the following sections. Floral resource composition and coverage assessments to inform foraging habitat suitability for Crotch's bumble bee are also being documented concurrently with botanical surveys. Data were recorded digitally and on hard copy in a field notebook. Digital data were collected on iOS devices with the Collector application on the ArcGIS Online platform, with 9.8-foot accuracy.

Protocol-Level Burrowing Owl Surveys

Jacobs biologists conducted breeding and nonbreeding season protocol-level burrowing owl surveys following the 2012 survey guidelines outlined in the CDFW (formerly California Department of Fish and Game) *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) (Table 5.2-4). The biologists have extensive experience surveying for burrowing owl in California.

Nonbreeding season and breeding season surveys were conducted throughout the BSA (Table 5.2-4). Weather conditions during both surveys were suitable for observing burrowing owl. In accordance with the 2012 survey guidelines, surveyors began their survey approximately 30 minutes after civil twilight and performed walking transects from east to west throughout the entire BSA, which encompasses the proposed BESS footprint plus a 547-yard buffer. Surveyors determined transect spacing of 20 yards was appropriate for full coverage; transect spacing was reduced to 7 yards during periods of lower visibility as a result of dense fog.

Surveyors recorded all observations of burrowing owl, as well as burrows and burrow complexes that showed signs of burrowing owl occupancy, including the presence of whitewash, pellets, prey remains, decoration materials, and feathers. Like the other field surveys, data were recorded digitally and on hard copy in a field notebook. Digital data were collected on iOS devices with the Collector application on the ArcGIS Online platform with 9.8-footaccuracy.

Additional burrowing owl breeding season surveys are scheduled in May, June, and July 2025. Results from all burrowing owl surveys in 2025 will be provided following completion of the surveys.

Tricolored Blackbird Habitat Assessment

Jacobs biologists led a tricolored blackbird habitat assessment within the BSA, conducted concurrently with other protocol-level and focused avian surveys (Table 5.2-4). The stock pond within the BSA was assessed for nesting suitability.

Protocol-Level Swainson's Hawk Surveys

Jacobs biologists conducted protocol-level Swainson's hawk nesting surveys to assess raptor nesting activity and density within the BSA (Table 5.2-4). These surveys were performed in accordance with the guidelines provided by the Swainson's Hawk Technical Advisory Committee (SHTAC) in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys for the California Central Valley (SHTAC 2000).

As per the 2000 protocol, Swainson's hawk surveys were conducted within a 0.5-mile area around the Project footprint.

The Swainson's hawk survey guidelines identify five survey periods, with each survey period corresponding with a recommended number of surveys (SHTAC 2000). To meet the minimum requirements of the Swainson's hawk survey guidelines, surveys must be completed in at least two of the survey periods immediately before a project's initiation (SHTAC 2000). Periods II and III were determined to be the optimum times for locating nests, as Swainson's hawk are highly active during these times.

Six surveys were conducted for the Project in Survey Phases II and III. Surveys were performed within the daily (morning) time windows and weather conditions prescribed in the survey protocol. All observations of raptor or corvid (for example, common raven, *Corvus corax*) nesting were recorded within these areas as per the survey protocol (SHTAC 2000). Like the other field surveys, data were recorded digitally (on iOS devices with the Collector application on the ArcGIS Online platform) and on hard copy in a field notebook.

Focused Eagle Nesting Surveys

In addition to the 0.5-mile buffer for Swainson's hawks surveys, focused surveys for nesting eagles including golden eagle and bald eagle were also conducted within a 2-mile buffer area, which is larger than the BSA (USFWS 2020). The 2-mile eagle survey buffer area was searched using desktop imagery and subsequently in field from vehicles and on foot for potential eagle nesting substrates, such as eucalyptus trees and utility poles. This field search was performed concurrently with protocol-level Swainson's hawk surveys.

Aquatic Resource Delineation

The USFWS NWI, USGS NHD, NRCS soil maps, and USGS topographic maps were queried to determine the location of potential wetlands and other water resources potentially occurring within the BSA (USFWS 2025b, NRCS 2025, USGS 2025a, USGS 2025b).

A field delineation was conducted by Jacobs biologists within the 103.31-acre BSA (Appendix 5.2A). The delineation was in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams* (Final Version) (USACE 2025), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008), and *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Resources Control Board 2019). Wetland indicator statuses for plants were taken from the National Wetland Plant List, version 3.4 (USACE 2018). Vegetation communities and land cover are described in the ARDR. The results of aquatic resources

desktop review and the field delineation are presented in the ARDR attached as Appendix 5.2A. Digital data were collected on iOS devices with the Collector application on the ArcGIS Online platform. Submeter accuracy was attained during the delineation by using a Trimble R1 receiver connected to devices via a Bluetooth connection.

5.2.1.10 Results

This section provides the results for botanical surveys, wildlife surveys, and an aquatic resource delineation. Wildlife species that were observed during the botanical and biological reconnaissance surveys are provided in Appendix 5.2C. CNDDB locations of special-status species within a 1-mile buffer of the BSA are shown on Figures 5.2-4 and 5.2-5 and are submitted under a request for confidential designation pending CEC staff review.

Botanical Survey Results to Date

Jacobs botanists conducted surveys according to CDFW and USFWS protocols in February, April, and May (Table 5.2-4). Surveys are proposed to continue in July and September.

Reference Site Visits

Botanists visited several special-status plant reference site populations that were ranked as high potential to occur, and are known to exist locally, to confirm that the surveys were conducted at a time of year when species would be apparent and identifiable (CNPS 2025, NRCS 2025). Potential reference sites were found by searching the Consortium of California Herbaria for documented herbarium vouchers within 50 miles of the BSA (CCH2 Portal 2025). As noted above, a reference site for Congdon's tarplant was visited on November 7, 2024. Caper-fruited tropidocarpum and stinkbells reference sites were visited on February 25-26, 2025. Reference sites for California rockjasmine and long-styled sand-spurrey were visited on April 3, 2025. Individuals of each species were observed during each respective reference population visit.

Botanical Survey

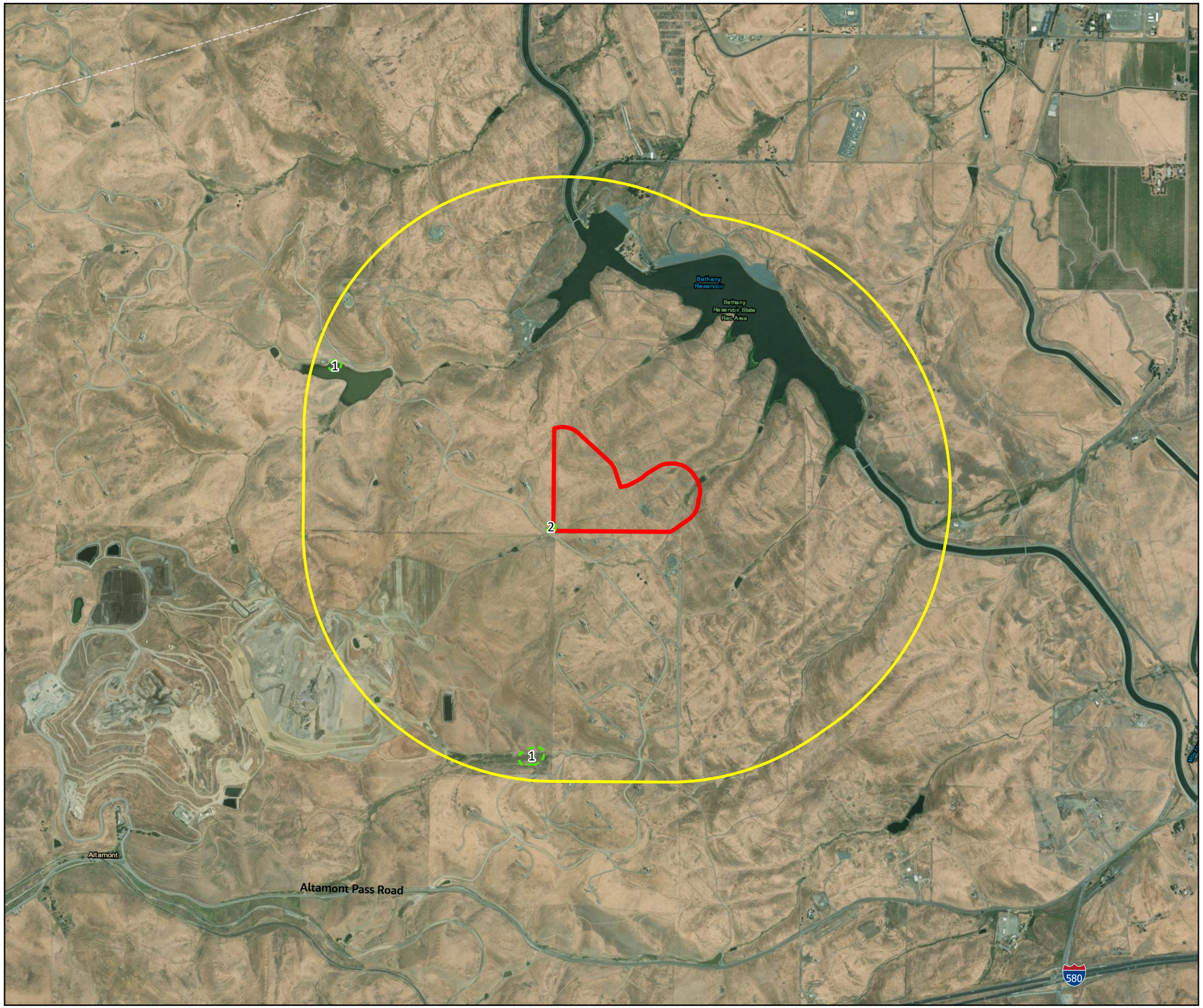
No special-status plant species were detected within the BSA during protocol-level botanical surveys to date; however, additional rare plant surveys are scheduled for 2025 to coincide with the appropriate blooming periods of species with potential to occur in the BSA. A complete list of observed plant species will be prepared upon conclusion of the protocol-level botanical surveys. Most of the surveyed habitat consists of nonnative annual grassland. This community is also associated with invasive plant species. Emergent wetlands and a stock pond are also found within the BSA.

Invasive Plant Species

During the BSA floristic surveys to date, three target invasive plant species ranked Cal-IPC moderate or high were observed. The target invasive species observed to date included the following:

- Italian thistle (*Carduus pycnocephalus*)
- Tocalote (*Centaurea melitensis*)
- Stinkwort (*Dittrichia graveolens*)

A full list of target invasive plant species observed will be compiled upon completion of the surveys in 2025.



Legend

- 500-ft Biological Study Area
- 1-Mile From Biological Study Area
- CNDDB Plant Occurence

Number	*Scientific Name*	**Common Name**
1	*Extriplex joaquinana*	San Joaquin spearscale
2	*Navarretia nigelliformis ssp. radians*	shining navarretia

Source:
1) ESRI Aerial Images, 2025

N

0 2,000 4,000

Feet

Figure 5.2-4
California Natural Diversity Database Plant Occurrences Within 1 Mile of the Project Area
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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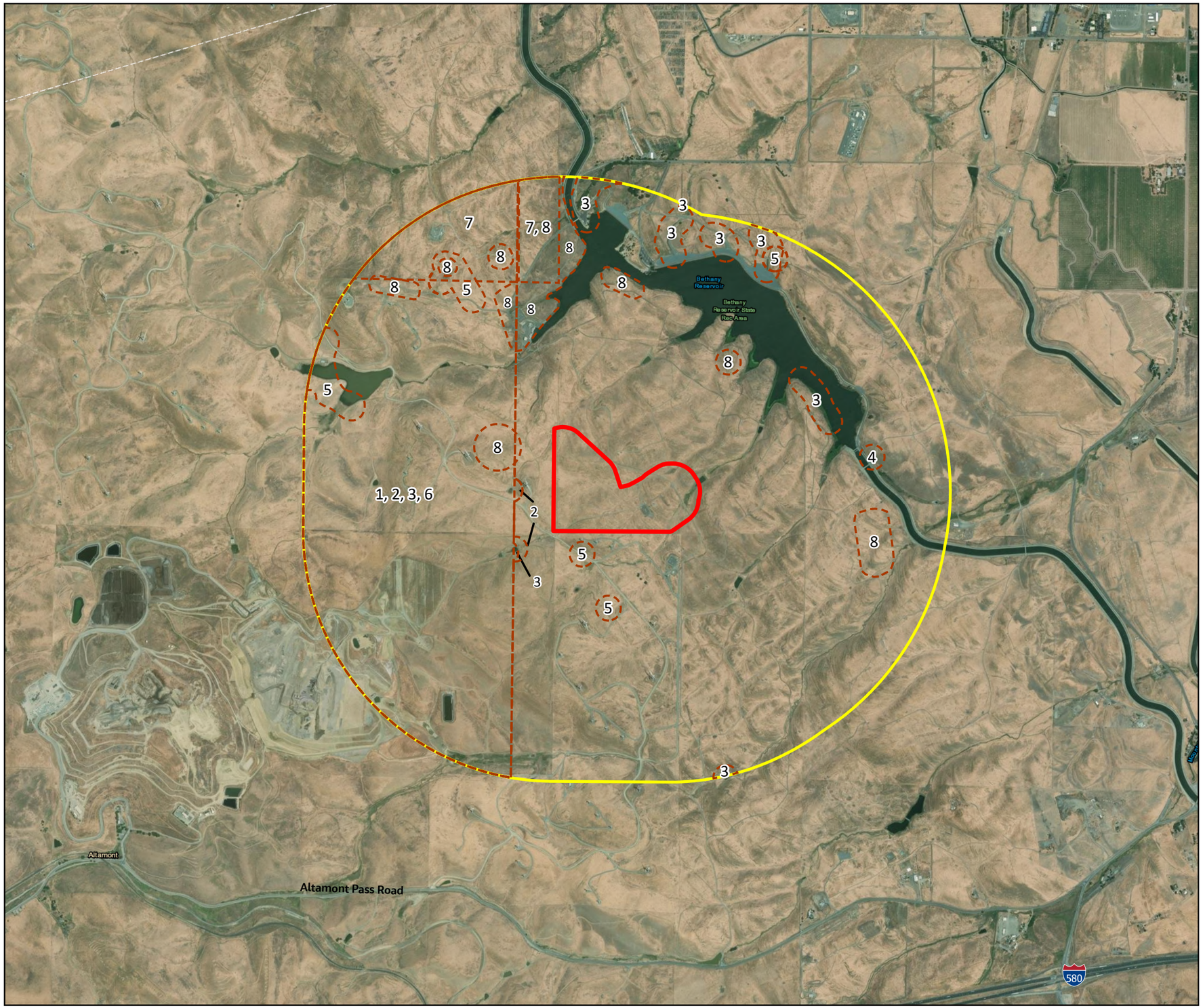

Legend

- 500-ft Biological Study Area
- 1-Mile From Biological Study Area
- CNDDB Wildlife Occurence

Number	Scientific Name	Common Name
1	*Branchinecta longiantenna*	longhorn fairy shrimp
2	*Ambystoma californiense pop. 1*	California tiger salamander - central California DPS
3	*Rana draytonii*	California red-legged frog
4	*Agelaius tricolor*	tricolored blackbird
5	*Athene cunicularia*	burrowing owl
6	*Falco mexicanus*	prairie falcon
7	*Taxidea taxus*	American badger
8	*Vulpes macrotis mutica*	San Joaquin kit fox

Source:
1) ESRI Aerial Images, 2025

N

0 2,000 4,000

Feet

Figure 5.2-5
California Natural Diversity Database Wildlife Occurrences Within 1 Mile of the Project Area
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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Land Cover Types and Vegetation Communities

Table 5.2-5 describes the four major vegetation communities and land cover types that occur within the various Project components in the BSA. The following subsections also briefly describe the vegetation types and land cover. Four vegetation communities and land cover types were mapped within the BSA (Figure 5.2-6):

- Nonnative annual grassland
- Developed
- Pond
- Emergent wetland

Table 5.2-5. Vegetation Communities within the Viracocha Hill BESS Biological Study Area

Vegetation Communities and Other Cover Types	Acreage within the Biological Study Area
Nonnative Annual Grasslands	98.27
Developed	2.95
Pond	0.31
Emergent Wetland	1.78
Total	**103.31**

Source: Jacobs 2025

Nonnative Annual Grasslands

Nonnative annual grassland is the dominant vegetation community within the BSA, and the area is grazed by cattle. A list of all vegetation species observed within the BSA will be compiled at the conclusion of all vegetation and rare plant surveys later in 2025, along with more assessments of the vegetation community within the BSA, including descriptions of floral composition.

Nonnative annual grasses are the dominant species within the BSA including wild oats, Bromes (*Bromus spp.*), Fescues (*Festuca spp.*), and Barleys (*Hordeum spp.*). Common forbs include filaree (*Erodium spp.*), California poppy (*Eschscholzia californica*), and clovers (*Trifolium spp.*) (CDFW 1988).

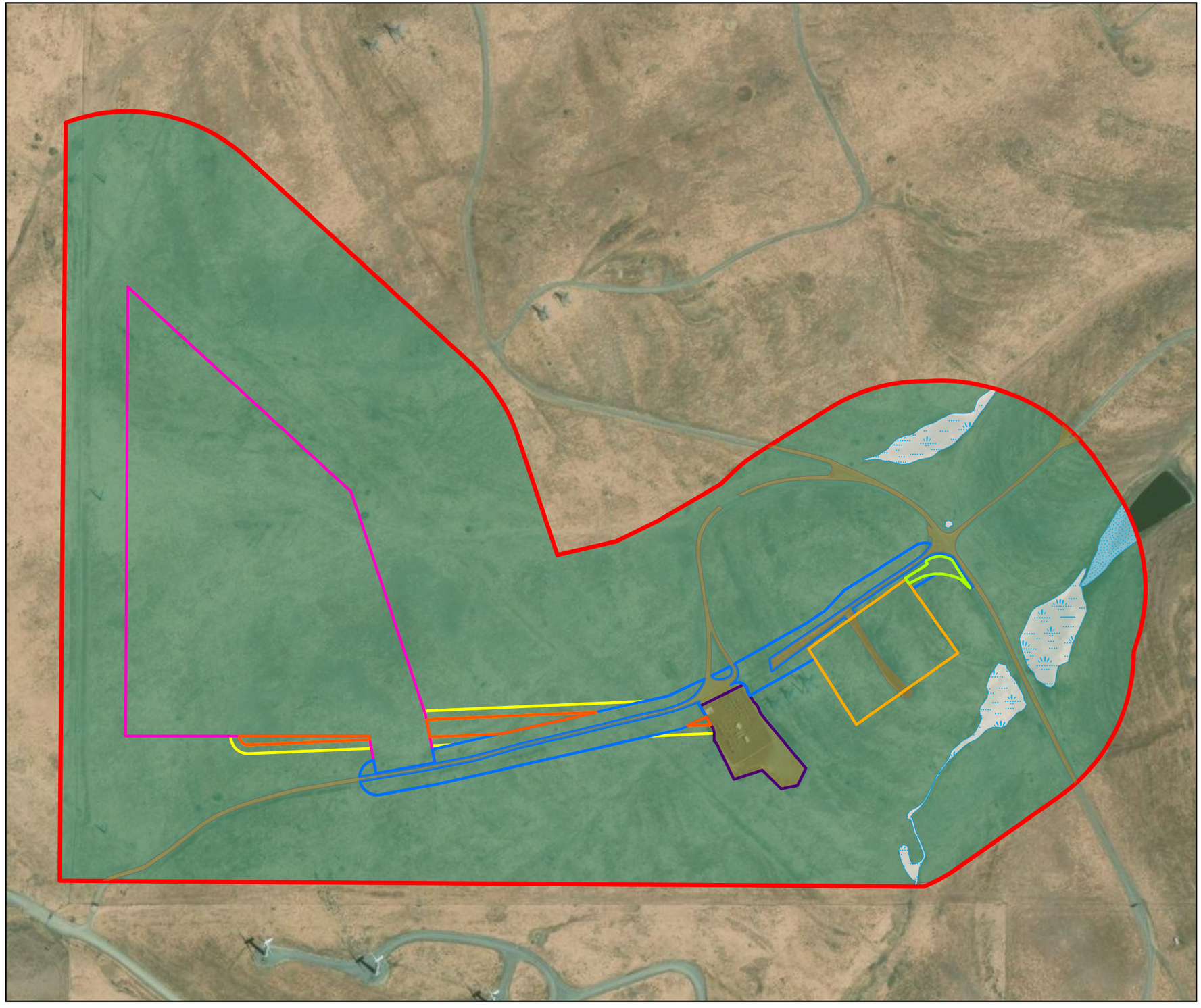
Non-vegetation features present within the nonnative annual grassland area within the BSA include rock piles and high-voltage powerline towers just east of Ralph Substation.

Developed

The developed land cover type is nonnatural with human-made structures. Within the BSA, these areas generally consist of access roads and Ralph Substation with an associated gravel area surrounding it. The areas lack natural vegetation cover. Existing Ralph Substation buildings and structures do not provide suitable roosting habitat for common bat species.

Pond

One stock pond occurs in the eastern portion of the study area. Stock ponds in the Altamont Pass area are small permanent or seasonal bodies of water that have been constructed for the purposes of retaining runoff water for livestock use. The surface area of these features varies widely depending on the time of year.



Legend

- 500-ft Biological Study Area
- Emergent Wetland
- Pond
- Nonnative Annual Grassland
- Developed

Temporary Impact

- Proposed 230-kV Gen-Tie

Permanent Impact

- Proposed 230-kV Gen-Tie
- Proposed Viracocha BESS Equipment Yard
- Ralph Substation
- Proposed Alternate Substation Area
- Proposed Improvements to Existing Access Road
- Proposed Access Road Widening Area

Source:
1) ESRI Aerial Images

N

0 500 1,000
Feet

Figure 5.2-6
Land Cover Impact Overview Map
Viracocha Hill BESS Project
Alameda County, California

Jacobs

Wetland

Palustrine emergent wetlands occur in the eastern portion of the study area in low-lying depressional areas. This community is dominated by hydrophytic vegetation, including Italian rye grass, Mediterranean barley, and salt grass (*Distichlis spicata).*

Wildlife Surveys

Reconnaissance-Level Surveys, Focused Wildlife Surveys, Protocol-Level Surveys, and Incidental Observations

A total of 51 wildlife species were observed during the reconnaissance-level survey, focused wildlife surveys, protocol-level surveys, and incidental observations, including 41 birds, 4 mammals, 4 reptiles, and 2 amphibians (Appendix 5.2C). Most wildlife species that inhabit, move through, or forage within the habitats identified previously are relatively common species.

The following 13 special-status wildlife species were observed during the reconnaissance-level survey, focused wildlife surveys, or protocol-level surveys, or were incidentally observed:

- American badger
- Bald eagle
- Burrowing owl
- California horned lark
- Ferruginous hawk
- Golden eagle
- Loggerhead shrike
- Northern harrier
- Northwestern pond turtle
- Prairie falcon
- Short-eared owl
- Swainson's hawk
- Tricolored blackbird

American Badger

Review of burrows within the BSA for potential American badger sign has been incorporated into several surveys to date. One adult American badger was incidentally observed in April 2025 at a den northeast of the BSA, during protocol-level burrowing owl surveys for this Project. American badger digging sign has been observed within the BSA, including within the Project area.

Bald Eagle

A pair of bald eagles was observed soaring over the BSA during 2024 and 2025 surveys, and bald eagles were observed mating near the BSA during spring 2025 surveys. Bald eagles are known to winter in the APWRA and forage near the BSA at Bethany Reservoir approximately 0.5 mile east; however, no suitable nesting or high-quality foraging habitat (large lakes, reservoirs, or rivers) is present in the BSA. Evidence of potential nesting within 1 mile of the BSA is limited, but potential nesting substrates, such as large eucalyptus trees and high-voltage power line towers, are located within 1 mile of the BSA.

Burrowing Owl

Weather conditions during surveys were suitable for observing burrowing owl. Wind speeds were generally low and there was no precipitation during the surveys; however, there was dense fog during the December 11, 2024 survey. Transect spacing was reduced during periods of lower visibility as a result of dense fog.

During the nonbreeding season protocol-level survey in December 2024, surveyors observed 25 burrows showing sign of burrowing owl occupancy (for example, displaying burrowing owl sign such as recent deposition of whitewash or burrowing owl pellets) within the BSA, including 4 within the proposed Project

footprint. Of these 25 occupied owl burrows, adult owls were observed entering or exiting the burrow of 6 of them. None of the 6 burrows with burrowing owl individuals observed at them were within the Project footprint; all were within the BSA outside of the Project footprint. Four burrows recorded within the Project footprint had whitewash and pellets at the mouths of the burrows, indicating they are currently being used by burrowing owl, though no burrowing owl individuals were observed entering or exiting. An additional four burrowing owl adults were observed foraging within the BSA and exited the BSA when surveyors approached them during transects.

During the April 2025 breeding season protocol-level survey, one additional occupied owl burrow was detected within the BSA. The occupied burrow contained pellets and whitewash at the mouth of the burrow but did not show signs of current use and may have been overlooked during the nonbreeding season survey. During the April 2025 breeding season survey, no burrowing owl individuals were observed within the BSA. The previously documented occupied burrows (from the December 2024 nonbreeding season survey) were revisited but did not show sign of current use (that is, fresh pellets and whitewash). Additional breeding season surveys are scheduled for May, June, and July 2025.

The nonnative annual grassland habitat with California ground squirrel burrow complexes that is present throughout the BSA provides high-quality foraging and nesting habitat for this species. Although most burrowing owl observations and occupied burrows are more than 500 feet from the BESS footprint, there are numerous occupied burrows within the buffer and an even greater number of suitable burrows that may become occupied by burrowing owl. Based on observations of this species inhabiting the BSA, burrowing owls are considered present in the BSA and are likely to continue to occupy the BSA.

Tricolored Blackbird

Jacobs biologists incidentally observed a flock of approximately 200 tricolored blackbirds foraging in the southern portion of the BSA during protocol-level Swainson's hawk surveys on March 28, 2025. Based on observations of this species foraging in the BSA, tricolored blackbirds are considered present in the BSA and are likely to continue to forage within the BSA. Nesting habitat is either absent from the BSA or marginal within the BSA, and nesting is not expected to occur.

Golden Eagle

Seven survey events for golden eagles were conducted within 2 miles of the BSA in spring 2025. Surveyors did not locate any golden eagle nests, but they routinely observed golden eagles and golden eagle pairs soaring and foraging within the BSA.

Based on the documented nesting and foraging individuals, presence of suitable nesting habitat surrounding the BSA, and ubiquitous foraging habitat throughout the BSA, golden eagle is considered to have a high potential to forage within and near the BSA. Potential nesting habitat is located outside the BSA but avoidance buffers may extend into the BSA.

Northwestern Pond Turtle

Jacobs biologists incidentally observed five adult turtles in a stock pond 0.3 mile northeast of the BSA in April 2025 during associated Swainson's hawk surveys for this Project. There is one stock pond within the BSA, which has hydrological connectivity to the stock pond approximately 0.3 mile northeast of the BSA. No turtles were seen within the BSA. There are no stock ponds within the Project footprint, but there is a high potential for Northwestern pond turtle to occur in the BSA.

Swainson's Hawk

Protocol-level surveys for Swainson's hawk in 2025 detected this species soaring over the BSA, although nesting within 0.5 mile of the BSA was not detected.

The BSA represents foraging habitat for this species. Although the species is most typically associated in recent times with the row crop agriculture of the Central Valley, annual grassland is a staple habitat type for its foraging and was likely the most-used habitat type for foraging before conversion of the Central Valley into large-scale agriculture (Bechard et al. 2020). Almost the entire BSA represents suitable

foraging habitat for the species in the form of nonnative annual grassland. The eucalyptus trees approximately 0.15 mile south of the BSA and planted trees surrounding Bethany Reservoir are considered highly suitable nesting habitat, though suitable nesting habitat is absent from the BSA.

Based on the presence of suitable nest trees within 0.5 mile of the BSA that may be occupied by Swainson's hawk during construction of the Project, and numerous known occurrences near the BSA, this species known to be seasonally present within the BSA in the summer breeding season.

Other Special-Status Birds

California horned lark, ferruginous hawk, loggerhead shrike, northern harrier, and prairie falcon were all observed within the BSA during surveys, but these species are not discussed individually in this section. California condor, Cooper's hawk, ferruginous hawk, peregrine falcon, and prairie falcon are avian species with no potential to nest within, or within an assumed disturbance buffer of, the BSA, and they would only be present in the BSA during migrations or foraging. An assessment of potential to occur for each of these species is included Appendix 5.2B, Table 5.2B-2.

Aquatic Resource Delineation

Jacobs wetland scientists performed an ARDR in March 2025 (Table 5.2-4).

No jurisdictional waters occur within the approximately 25-acre Project footprint. Within the larger BSA, the ARDR identified four Palustrine, Emergent, Persistent (PEM1) wetlands on the eastern portion of the BSA. The NWI also identifies an unnamed drainage in the northwesternmost corner of the BSA as Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC); this feature was not observed. As noted previously, one stock pond is also present in the eastern portion of the BSA but not within the Project footprint. Aquatic resources are discussed in greater detail in the attached ARDR (Appendix 5.2A).

5.2.2 Environmental Analysis

From the list of biological and aquatic resources that were evaluated to occur or to have potential to occur within the BSA, potential Project impacts on those resources were evaluated. This section presents those impact discussions.

Potential effects from the Project may be described as either direct impacts or indirect impacts, and either of those types may also be considered either temporary impacts or permanent impacts (that is, there may be direct impacts that are temporary or direct impacts that are permanent). These impact categories are defined as follows and are applied as part of the environmental analysis presented in this section:

- **Direct:** The California Environmental Quality Act (CEQA) defines direct impacts as those that result from a Project and occur at the same time and place as the Project. Any alteration, disturbance, or destruction of biological resources that would result from Project-related activities is considered a direct impact. Examples of direct impacts include loss of habitat resulting from clearing vegetation for site grading, the direct mortality of a wildlife species individual that is crushed by machinery during construction, or the abandonment of a bird nest by its parents due to increased Project activity.
- **Indirect:** As a result of Project-related activities, biological resources also may be affected in a manner that is not direct. CEQA defines indirect impacts as those that are caused by a Project but that occur later in time or are farther removed in distance, although they are reasonably foreseeable and are related to the Project. Examples include increased erosion from Project traffic or construction activities, or the introduction of invasive plants, both of which may decrease habitat quality for special-status species leading to a decrease in species abundance or individuals' body condition.
- **Temporary:** Any impacts considered to have reversible and short-term effects on biological resources can be viewed as temporary. Typically, temporary impacts are defined as impacts in which the pre-Project condition is restored.

- **Permanent:** Impacts that are not temporary, as defined above, are typically considered permanent. This includes structures and other facilities built during construction projects, for example constructing a new battery energy storage facility or a new permanent paved access road.

5.2.2.1 Significance Criteria

The Project may result in a significant impact on the environment if it would do the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as endangered, threatened, candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by CDFW or USFWS
- Have a substantial adverse effect on any riparian habitat or other special-status natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS
- Have a substantial adverse effect on federal or state protected waters of the United States (including wetlands) as defined by Sections 404 and 401 of the 1972 Amendments to the Federal Water Pollution Control Act, commonly known as the Clean Water Act, or the Porter-Cologne Act, either through direct removal, filling, hydrological alteration, or other means
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory native wildlife corridors, or impede the use of wildlife nursery site
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan
- Threaten to eliminate a plant or wildlife community

CEQA Section 15380 provides that a plant or wildlife species may be treated as “rare or endangered” even if the species is not on one of the official lists if, for example, it is likely to become endangered in the foreseeable future.

5.2.2.2 Potential Impacts of Construction and Demolition

This subsection provides a discussion of potential impacts during construction and demolition; potential impacts that may result from the Project in its operations phase are discussed separately.

BESS Site

The Project footprint totals approximately 25 acres, including the Project footprint as well as ancillary features, as described earlier.

Potential permanent impacts include an approximately 17-acre area containing the BESS yard, laydown area, substation, and retention pond; the existing Ralph Substation at approximately 1.1 acre; new switching station or a line-tap (if-needed) at approximately 2.1 acres; proposed access road entrance improvements at 0.15 acre; improvements to 0.3 mile of an access road using a 50-foot buffer resulting in the removal of approximately 3.5 acres of nonnative annual grassland; and a 1,325-foot gen-tie line using a 25-foot buffer resulting in the removal of an additional 0.6 acre of nonnative annual grassland.

Potential temporary impacts include only the outer band of the gen-tie line buffered between 25 feet and 50 feet from centerline along 1,325 feet, resulting in 0.70 acre of temporary impact on nonnative annual grassland (Figure 5.2-6).

Potential Project impacts from the construction phase are discussed on a resource-by-resource basis in the following sections. Potential impacts from the demolition phase would be similar or reduced

compared to those from construction; therefore, this section focuses on potential impacts from construction. In general, the most significant Project effects on biological resources are likely to be the direct effects of construction, including site preparation (vegetation clearing, grubbing, and grading), construction activity, and habitat loss resulting from the construction of Project features. Indirect impacts may also result from habitat loss or degradation, or increased human activity in the area, although these are likely less significant than the direct effects previously mentioned.

Noise from construction could temporarily discourage wildlife from foraging and nesting immediately adjacent to the Project footprint. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction activities could reduce the reproductive success of nesting birds. Noise levels will vary during the construction period depending on the construction phase.

Project construction is expected to be generally similar to that of other BESS facilities in terms of activities and equipment. Noise attenuation measures and applicable LORS for construction have been incorporated into the Project design and are discussed in Section 5.7. Impacts on biological resources from the construction and demolition phases will be less than significant with the incorporation of mitigation measures, which include a Worker Environmental Awareness Program (WEAP) to identify sensitive biological resources, preconstruction surveys, avoidance buffers and exclusion, and onsite biological monitoring.

Most of the Project footprint is within nonnative annual grassland, with some smaller areas of developed land (Figure 5.2-6), and most of the impacts would be permanent. Once construction is complete, the Applicant would restore temporarily disturbed nonnative annual grassland areas to their preconstruction conditions (Section 5.2.4). Wildlife species are expected to resume their pre-Project use of the restored nonnative annual grassland areas within the Project footprint.

Vegetation Communities

The only land cover types with permanent and temporary impacts are nonnative annual grassland and developed (Table 5.2-6). Project impacts are shown on Figure 5.2-6. No wetlands, ponds, or streams will be impacted by the Project.

Table 5.2-6. Temporary and Permanent Impacts on Vegetation Communities and Other Land Cover Types within the Project Footprint

Vegetation Communities and Other Land Cover Types within the Project Footprint	Impacts (acres)	
	Temporary*	Permanent
Nonnative Annual Grassland	0.70	22.20
Developed	0	1.82
Total	**0.70**	**24.02**

*The gen-tie is the only project feature with a temporary impact type. All other project features are assumed to be a permanent impact.

Permanent direct effects on vegetation communities would result from vegetation removal for the construction of permanent Project elements, including structures and roadways. Temporary direct effects on vegetation and wildlife habitat would occur during construction where vegetation is removed during construction, damaged by dust, crushed by vehicles, or otherwise damaged, but restored following construction.

Although the Project requires permanent and temporary impacts on habitat, losses resulting from this Project are not considered significant with mitigation incorporated, by themselves or cumulatively with other projects. Discussions of individual species and habitat, and incorporation of mitigation measures for those impacts, are provided in the following sections.

Losses resulting from this Project are not considered significant, by themselves or cumulatively with other projects, because nonnative annual grasslands are not a sensitive biological community, and this habitat is widely abundant in the region. The permanent and temporary effects on the nonnative annual grassland habitat within the BESS footprint are negligible compared with the availability of this habitat type regionally.

Project effects on the nonnative annual grassland within the BSA will be the minimum necessary to construct the Project. With the implementation of mitigation measures discussed in Section 5.2.4, the Project will result in less-than-significant impacts on vegetation communities.

Aquatic Resources

As Section 5.2.1, there are no federal or state jurisdictional wetlands or waters within the Project footprint, although aquatic resources are present within the BSA east of the Project footprint. Because there are no aquatic resources within the Project footprint, the Project is not expected to have direct effects on aquatic resources.

However, indirect impacts on aquatic resources may occur (for example, in the form of dust accumulation or increased sediment loading from erosion upstream of the aquatic resources). Indirect impacts will be avoided or minimized through implementation of stormwater best management practices (BMPs), including dust control measures identified in Section 5.1.6.2, Air Quality.

Critical Habitat

Direct permanent and temporary impacts on federally designated Critical Habitat for the California red-legged frog may occur from Project construction. As described in Section 5.2.1, the entire BSA overlaps Critical Habitat Unit ALA-2 for California red-legged frog. Within the Project footprint, the nonnative annual grassland habitat constitutes suitable upland and dispersal habitat Critical Habitat Physical and Biological Features as defined by the USFWS (2010a).

Permanent direct impacts may occur where nonnative annual grassland habitat will be removed to prepare the site for the construction of permanent Project elements, including the BESS structures and access roads. Total permanent impacts on the upland and dispersal habitat Physical and Biological Features of Critical Habitat of California red-legged frog critical habitat are approximately 22.2 acres within nonnative annual grassland. The entirety of the 17-acre BESS facility will be a permanent impact within nonnative annual grassland habitat. The Project will implement compensatory mitigation as described in Section 5.2.4.7.

Direct temporary impacts may occur where nonnative annual grassland habitat will be removed to prepare the site for the construction of the gen-tie line. Total temporary impacts on the upland and dispersal habitat Physical and Biological Features of Critical Habitat of California red-legged frog critical habitat are 0.7 acre. Temporarily impacted areas will be restored to pre-Project conditions following Project construction.

Although direct impacts on the aquatic breeding and nonbreeding habitats are not expected, these habitats identified within the BSA may be subject to indirect disturbance associated with construction of the BESS. Indirect effects on aquatic habitats will be avoided or minimized through implementation of construction stormwater BMPs (Section 5.2.4).

Impacts on California red-legged frog critical habitat (upland and dispersal habitat) will be reduced to a less-than-significant level with mitigation measures incorporated, including those proposed in Section 5.2.4.

CDFW Special-Status Habitats

Because the BSA does not contain any CDFW-designated special-status habitats, as described in Section 5.2.1, there will not be impacts on this resource type.

Wildlife Movement Corridors

The BSA is within a CEHCP Essential Connectivity Area and an ACE Irreplaceable and Essential Corridor. The Project footprint itself is small relative to the landscape level context of CEHCP and ACE assessments, and with compensatory habitat mitigation incorporated as described in Section 5.2.4.7 impacts will be reduced to less-than-significant level.

Special-Status Plants

Suitable habitat is present within the BSA for the rare plant species listed in Appendix 5.2B, Table 5.2B-2. Protocol-level rare plant surveys are in progress.

If special-status plant species are present within BSA, construction of the Project may result in impacts on special-status plants. Impacts on rare plants are not expected to be significant with implementation of proposed avoidance and minimization measures, such as the WEAP, preconstruction surveys, and biological monitoring.

Target Invasive Plant Species

Project construction may result in the introduction of invasive plant species to the BSA. For example, the seeds of invasive plants may be carried into the BSA on the tires of trucks or construction equipment. With the implementation of general mitigation measure Vehicle and Equipment Cleaning, impacts from the introduction of target invasive species will be reduced to less than significant.

Special-Status Wildlife Species

The Project may affect special-status wildlife species and their habitats. These effects may be direct and indirect, and temporary and permanent.

Construction activities may result in direct permanent effects via the death of individuals. Such Project-related mortality may result from accidental vehicle strikes due to increased vehicle traffic, crushing during vegetation removal or grading and trenching, and/or entombment of wildlife in subterranean dens or burrows. Direct effects may also result from avian nest abandonment due to an increase in disturbance from construction noise or activity. Other potential causes of wildlife mortality or injury include entrapment in excavations or other supplies and equipment or poisoning by ingestion or exposure to stored or spilled chemicals. Direct effects may also include the abandonment of the site by special-status species during construction due to an increase in construction-related noise and activity; which may result in a decrease in the body condition or fitness of individuals, as well as a general decrease in the abundance of special-status species populations or a decrease in species richness within the BSA. With the implementation of the WEAP, preconstruction survey plan (including avoidance buffers and relocation specifics), stormwater pollution and prevention plan (SWPPP) and erosion control, construction speed limits, and biological monitoring measures, the impacts on special-status wildlife will be less than significant.

Equipment used during construction of the facilities would result in air emissions of particulate matter, nitrogen oxides, carbon monoxide, volatile organic compounds, and sulfur dioxide, constituting a direct temporary impact. These pollutants have the potential to affect biological resources, although construction emissions are expected to be below applicable ambient air quality health and secondary standards and, likewise, would be below significance criteria established for impacts on wildlife. Detailed information on construction emissions is included in Section 5.1, Air Quality.

Nighttime construction lighting may disturb wildlife using areas adjacent to the BESS (such as nesting birds, nocturnal mammals, or foraging or dispersing herpetofauna), constituting a direct temporary impact. Additionally, certain lighting may attract insects that, in turn, may attract bats and some bird species to forage. Construction lighting will meet the requirements for security and safety. It will be shielded and pointed downward and away from the habitat outside the BSA to minimize impacts on

nesting birds and other nearby wildlife, and to reduce the potential for avian and bat attraction. With implementation of lighting mitigation measures, the impacts on special-status wildlife will be less than significant.

Temporary and permanent indirect effects may also result from the destruction of habitat on which special-status species depend. Project construction may represent a loss of special-status wildlife species habitat, including upland habitat for special-status herpetofauna, denning and foraging habitat for special-status mammal species, and foraging or nesting habitat for special-status avian species. All habitat within the Project footprint is either nonnative annual grassland vegetation type or is disturbed/developed. Table 5.2-6 provides impact acreage for nonnative annual grassland. A reduction in available habitat for special-status species may result in a decrease in the body condition or fitness of individuals, as well as a general decrease in the abundance of special-status species populations or a decrease in species richness within the BSA. Temporary impact areas will revert to previous use after construction. Special-status wildlife species could use the similar habitats in the Project vicinity as alternatives during construction, and these habitats are not a limiting factor for these species. With implementation of mitigation measures, such as compensation for loss of special-status species habitat, the impacts on special-status species habitat will be less than significant.

Special-Status Amphibians, Including California Tiger Salamander, California Red-Legged Frog, and Western Spadefoot

Project construction may have direct permanent and temporary impacts on California tiger salamander, California red-legged frog, and Western spadefoot. Although impacts on breeding habitats are not expected as a result of Project construction, these species are either known to be present within or near the BSA (California tiger salamander and California red-legged frog) or have a high potential of occurring in the BSA (Western spadefoot). Direct impacts on individuals via mortality may occur from collapsing occupied burrows within permanent impact areas and vehicle strikes. Individuals potentially inhabiting burrows or crevices within the BSA may also be impacted by the noise, dust, and other disturbances associated with Project construction. Indirect disturbance to individuals may occur in the form of increased predation by predators attracted to the construction site (such as common ravens).

However, suitable upland habitat exists in the Project vicinity surrounding the BSA, and mitigation measures would be in place to relocate individuals and to enhance or create additional suitable upland habitats. With the implementation of mitigation measures, including the WEAP, preconstruction survey plan (including avoidance buffer and relocation specifics), construction speed limits, biological monitoring, and habitat compensation, impacts on California tiger salamander, California red-legged frog, and Western spadefoot will be less than significant.

Northwestern Pond Turtle

Project construction may have limited direct permanent and temporary impacts and indirect impacts on Northwestern pond turtle. Although suitable aquatic habitat, where the species spends the majority of its life, will not be impacted by construction, this species is well documented within the Altamont area and may use nonnative annual grassland in the work area for nesting or overland dispersal. However, these events in upland habitat are relatively rare in the species' life cycle, and for the most part are confined to aquatic areas. Direct impacts on this species may occur if individuals are within the upland Project footprint areas during construction, although this is unlikely. Similarly, it is unlikely that the species will choose to nest in the upland areas that will be disturbed in the Project footprint since they are relatively far from stock ponds; therefore, accidental destruction of northwestern pond turtle nests/eggs is unlikely. Individuals nesting or basking within the BSA may be impacted by the noise, dust, and other disturbances associated with Project construction. Indirect disturbance to individuals may occur in the form of increased predation by predators attracted to the construction site.

With the implementation of mitigation measures, including the WEAP, preconstruction surveys, construction speed limits, SWPPP, erosion control, and biological monitoring, impacts on Northwestern pond turtle will be less than significant.

Other Special-Status Reptiles, Including Blainville's Horned Lizard, California Glossy Snake, and San Joaquin Coachwhip

Project construction may have direct permanent and temporary impacts and indirect impacts on Blainville's horned lizard, California glossy snake, and San Joaquin coachwhip. As with the discussion of impacts on special-status amphibians, direct impacts on individuals may occur from mortality caused by site preparation such as vegetation removal and grading, from collapsing occupied burrows, or from vehicle strikes. Individuals basking within the BSA would be impacted by the noise, dust, and other disturbances associated with the construction of the Project. Indirect disturbance to individuals may also occur in the form of increased predation by predators attracted to the construction site.

With the implementation of mitigation measures, including the WEAP, preconstruction surveys, species relocation plans, construction speed limits, and biological monitoring, impacts on Blainville's horned lizard, California glossy snake, and San Joaquin coachwhip will be less than significant.

Burrowing Owl

Project construction may result in direct and indirect impacts on burrowing owl individuals, as well as permanent and temporary impacts on burrowing owl foraging and nesting habitat.

If present during construction, they could be directly impacted by work activities, including being struck by vehicles and equipment, being accidentally entombed within burrows during site preparation (vegetation removal and grading) activities, or abandoning roosting or breeding burrows due to construction activity (for example, noise or the presence of workers near their burrows).

Burrowing owls inhabiting burrows may also be impacted by the noise, dust, and other disturbances associated with the construction of the BESS. Indirect effects could include disruption of burrowing owl nesting behavior during the breeding season caused by auditory or visual disturbance resulting from construction activities. As is the case with other species of birds with all wildlife species, or other species of wildlife in other taxa, individuals will display different responses and tolerance to human-caused disturbance along a gradient of possible behavior. Scobie and Faminow (2000), cited in the 2012 Staff Report on Burrowing Owl Mitigation (CDFG 2012), estimate disturbance in the form of harassment may occur when low-level disturbance work activities are within 219 yards of nesting owls and within 547 yards for high-level disturbance activities. It is difficult to predict the response a given nesting pair of burrowing owls will have to human disturbance when the disturbance may also occur at different intensities on different days depending on equipment and duration of work on a given day.

These activities could also have other direct effects, such as nest abandonment resulting in mortality of eggs or young, which may then cause indirect effects, such as reduced nesting opportunities or otherwise inhibiting breeding opportunity and viability. Disturbance and displacement associated with work activities may increase the potential for predation, competition for food and shelter, or strike by vehicles on access roads. However, it can be assumed that burrowing owls within the Project footprint are accustomed to low levels of baseline disturbance because of the routine cattle grazing activities, and their associated vehicle and foot traffic, that occur onsite.

The Project may also introduce indirect effects on burrowing owls by increasing risk of predation. Predators, such as the following may be attracted to the site by trash from construction activities:

- common raven
- coyotes (*Canis latrans*)
- red foxes (*Vulpes vulpes*)
- racoons (*Procyon lotor)*
- skunks *(Spilogale gracilis* and *Mephitis mephitis)*

Suitable nonnative annual grassland habitat is widespread in the BSA vicinity that burrowing owls could use during Project construction. Post-restoration, temporarily displaced birds could be expected to return to the nonnative annual grassland habitat of the BSA.

With the implementation of mitigation measures, including the WEAP, preconstruction survey plan, biological monitoring, avoidance buffers, trash management, construction speed limits, and habitat compensation, habitat restoration, impacts on burrowing owl will be less than significant.

Special-Status Grassland-Nesting Birds, Including California Horned Lark, Grasshopper Sparrow, Northern Harrier, and Short-Eared Owl

Project construction may have direct and indirect impacts on individual California horned lark, grasshopper sparrow, northern harrier, and short-eared owl as well as permanent and temporary impacts on foraging and nesting habitat. The Project would have permanent and temporary impacts on foraging and nesting habitat (Table 5.2-6).

If present during construction, they could be directly impacted by work activities, including being struck by vehicles and equipment, being accidentally crushed during site preparation (vegetation removal and grading) activities, or abandoning nests due to construction activity (for example, noise or the presence of workers).

Individuals may also be temporarily impacted by the noise and activity associated with Project construction, leading to an inability to complete normal feeding or mating activities, and leading to a decrease in fitness or body condition. However, suitable nonnative annual grassland habitat that these species could use during the Project construction is widespread in the BSA vicinity. In addition, indirect disturbance of adjacent populations of these bird species from construction is not considered permanent, as temporarily displaced birds could be expected to return to adjacent areas upon completion of Project construction. With the implementation of mitigation measures, including the WEAP, a construction site speed limit, preconstruction surveys, avoidance buffers, biological monitoring, and habitat restoration, impacts on California horned lark, grasshopper sparrow, northern harrier, and short-eared owl are expected to be less than significant.

Tricolored Blackbird

Similar to the impacts on other special-status grassland-nesting birds discussed earlier, Project construction may have direct and indirect impacts on tricolored blackbird individuals, as well as permanent and temporary impacts on foraging habitat. Foraging individuals may be temporarily impacted by the noise, dust, and other disturbances associated with Project construction but will have ample foraging opportunities in the vicinity. Nesting is not expected; therefore, no impacts on nests or nesting individuals are expected. With the implementation of mitigation measures including the WEAP, preconstruction surveys, biological monitoring, and compensation for impacts on foraging habitat, impacts on tricolored blackbird will be less than significant.

Loggerhead Shrike

Project construction may have direct and indirect impacts on loggerhead shrike individuals, as well as permanent and temporary impacts on foraging and nesting habitat. Foraging individuals may be temporarily impacted by the noise, dust, and other disturbances associated with Project construction but will have ample foraging opportunities in the vicinity. Nesting is not expected; therefore, no impacts on nests or nesting individuals are expected. With the implementation of mitigation measures including the WEAP, preconstruction surveys, and biological monitoring, impacts on loggerhead shrike will be less than significant.

Special-Status Raptors

Project construction may result in direct and indirect impacts on individual special-status raptors including golden eagle, bald eagle, white-tailed kite, and Swainson's hawk, as well as permanent impacts on foraging and temporary impacts on nesting habitat. Nesting habitat is absent from the BSA but is present in the vicinity of the BSA, and indirect impacts on nesting birds may potentially occur during Project construction due to noise, dust, increased traffic, increased personnel on the ground, visual changes for

nests that may be within the line of sight, or other potential disturbances. Foraging individuals may be temporarily impacted by the noise, dust, and other disturbances associated with Project construction but will have ample foraging opportunities in the vicinity. Direct and indirect effects on special-status raptors that are expected to only occur during the non-nesting season, including ferruginous hawk and prairie falcon, are unlikely. With the implementation of mitigation measures, including the WEAP, preconstruction surveys, and biological monitoring, impacts on golden eagle, bald eagle, white-tailed kite, and Swainson's hawk will be less than significant.

American Badger and San Joaquin Kit Fox

Project construction may result in direct temporary and permanent impacts, as well as indirect impacts, on American badger and San Joaquin kit fox. Direct impacts on individuals may occur if these species are present within burrows that are collapsed or destroyed by construction activities within permanent impact areas. Individuals potentially inhabiting burrows within the Project footprint may also be temporarily impacted by the noise, dust, or other disturbances associated with Project construction. However, many burrows exist in the BSA vicinity that would be available for these species to use, and temporarily displaced individuals could be expected to return to the nonnative annual grassland habitat within the BSA upon completion of Project construction. With the implementation of mitigation measures, including the WEAP, preconstruction surveys, biological monitoring, and habitat restoration, impacts on American badger and San Joaquin kit fox will be less than significant.

Special-Status Bats

Pallid bat and Townsend's big-eared bat have low potential to forage in the BSA in nonnative annual grassland and wetland areas. Roosting is not expected due to the lack of suitable roosting habitat. Project impacts, if any, are limited to temporary disturbance impacts resulting from alternative noise and lighting regimes associated with construction. Through implementation of mitigation measures, including the WEAP, noise, nighttime lighting restrictions, preconstruction surveys, and biological monitoring, impacts on special-status bats will be less than significant.

Other Native Nesting Birds

The Project will result in the permanent and temporary loss of potential foraging and nesting habitat for some migratory and resident birds. However, this loss is expected to be a less-than-significant impact because of the amount of similar nonnative annual grassland habitat in the vicinity available for use, and temporarily displaced individuals could be expected to return to the nonnative annual grassland habitat within the BSA upon completion of Project construction.

Potential impacts from Project construction on nesting birds may occur from temporary construction noise and activity. Site preparation activities including vegetation removal may impact grassland-nesting bird species if those species have nests within the Project footprint.

Preconstruction surveys will occur before all ground-disturbing activities commence and, when feasible, activities will occur outside of the nesting season (generally February 1 through August 31). With the implementation of the proposed mitigation measures, including preconstruction nesting bird surveys and biological monitoring, impacts on nesting birds are expected to be less than significant.

5.2.2.3 Potential Impacts of Operation

During the operation phase of the Project, routine operations and maintenance activities are expected to generate minor levels of disturbance, including minor amounts of dust, nighttime lighting, limited vehicle traffic, and limited noise. The level of disturbance from noise, lighting and other elements associated with maintenance activities would be of a far smaller magnitude than the impacts associated with Project construction. Potential operations phase impacts on biological and aquatic resources are detailed in the following sections.

Aquatic Resources and Critical Habitat

Special-status habitat types, including aquatic resources, are not expected to be impacted during the operations phase. Any potential impacts that may occur will be avoided or minimized through implementation of mitigation measures for construction stormwater BMPs and dust control measures.

Aquatic Resources

Operation of the Project is not expected to result in significant direct or indirect impacts on federal or state jurisdictional waters. Indirect effects, including erosion, sedimentation, or dust from vehicle travel along access roads improved by the Project may occur, but will be avoided or minimized through enforced onsite speed limits and permanent erosion control BMP implementation following construction.

Critical Habitat

Operation of the Project is not expected to result in significant direct impacts on designated California red-legged frog critical habitat. Indirect effects on aquatic breeding and nonbreeding Physical and Biological Features of Critical Habitat, including erosion, sedimentation, or dust from vehicle travel along access roads to the Project may occur. Any potential impacts will be avoided through implementation of mitigation measures, including the WEAP, speed limits and permanent erosion control BMP implementation following construction.

Nitrogen Deposition

The Project will result in emissions of nitrogenous compounds such as nitrogen oxide gases (NO and NO_2 or NO_X) from the proposed diesel-fueled emergency generator and fire pump. NO_X converts to nitrate particulates in a form that is suitable for uptake by most plants and could promote plant growth. Because the primary habitat in the Project area is nonnative annual grassland, which is not generally negatively affected by nitrogen deposition, this analysis focuses on wetlands because they are a common natural habitat in the Project vicinity where nitrogen deposition may occur. The critical load for atmospheric nitrogen deposition into wetlands is difficult to establish because nitrogen loading in wetlands is often affected by sources other than atmospheric deposition (Morris 1991).

A formal nitrogen deposition modeling analysis was not conducted due to the minimal expected amount of NO_X released from Project operations. A criteria pollutant modeling analysis was performed for NO_X. Using the NO_X modeling impacts as a surrogate for nitrogen deposition for 5 years of meteorological data (comprised of 1-hour averages) resulted in an annual maximum NO_X impact of an estimated 0.01 microgram per cubic meter ($\mu g/m^3$). It is expected that a total of 0.04 tons per year (tpy) or 80 pounds of NO_X will be released from operations of the two combustion sources, based on compliance with state law that limits their operation to no more than 50 hours per year (each) for maintenance and testing.

To further demonstrate that the Project's nitrogen deposition would not result in a significant biological impact, it was conservatively assumed that all nitrogen compounds emitted were in the form of nitric acid (HNO_3). The maximum annual NO_X concentration at every receptor included in the criteria pollutant air dispersion model, extending out 2,187 yards from the Project fenceline, was determined from the five individual meteorological years modeled (2013 – 2017).

Based on the conservative modeling approach,[1] the maximum modeled annual deposition averaged over the entire receptor grid was estimated to be approximately 0.015 kilogram per hectare per year (with a maximum value of 0.13 kilogram per hectare per year). Based on this estimate, the Project's nitrogen

[1] The approach for estimating nitrogen deposition simplistically assumes that all nitrogen oxide emissions, which are emitted as gaseous compounds, are instantaneously converted to a depositional forms of nitrogen compounds, when in reality this reaction requires time, sunlight, and moisture for gaseous nitrogen compounds to convert to depositional forms of nitrogen, which would tend to generate significantly lower nitrogen deposition concentrations than are provided in this analysis.

deposition impacts are not expected to substantially contribute to nitrogen loading the wetlands surrounding the Project.

Vegetation Communities and Special-Status Plant Species

Operations phase activities may potentially result in indirect impacts on vegetation communities or special-status plant species.[2] Indirect impacts that may occur include unauthorized access by workers or their vehicles, trampling, and disturbing vegetation. However, all operational activities would occur on graveled roads and within the Project footprint; therefore, disturbance is not expected. These impacts will be avoided through the implementation of Project mitigation measures, including the WEAP.

Special-Status Wildlife Species

Operations phase activities may result in direct or indirect impacts on special-status wildlife species. These impacts would be less than construction phase impacts. Operation of the 1,325 foot-long gen-tie, including steel pole structures and lines, may result in direct or indirect impacts on special-status birds.

Operations activities may potentially result in direct mortality of wildlife by crushing or vehicle collisions during operation and maintenance activities. Implementation of avian protection measures in the design, installation, and maintenance of gen-tie steel pole structures and lines, and all electrical components, will reduce the likelihood of electrocutions of large birds (APLIC 2006). Implementation of avian protection measures, speed limits, and the WEAP will reduce the Project's direct impacts on special-status wildlife species to a less-than-significant level.

Operations phase indirect impacts are possible from noise, lighting, and other activity associated with the operations of the Project. Lights may attract insects, which in turn could attract nocturnal foraging insectivores, including bats and herpetofauna. Lighting on the Project site will be limited to areas required for safety, will be directed onsite to avoid backscatter, and will be shielded to the greatest extent practical. All lighting that is not required to be on during nighttime hours will be controlled with sensors or switches operated such that the lighting will be on only when needed. Noise is anticipated to be minimal during operations and the Project will meet all required Alameda County LORS at the fenceline. With implementation of mitigation measures including the WEAP, lighting restrictions, operational noise and lighting would have less-than-significant impacts on special-status wildlife.

5.2.3 Cumulative Impacts

With mitigation incorporated, the Project itself will not have significant adverse effects on biological resources. The Project is in the APWRA, with existing and ongoing wind power development. The Project will reduce the disturbance area to extent feasible, which would reduce direct and indirect effects on habitat. Transient wildlife will use the similar habitats in the Project vicinity as alternatives during construction, and these habitats are not a limiting factor for these species. All temporary disturbances would be restored post-construction. Existing land uses, such as cattle ranching, are expected to continue in the BSA during and after construction of the Project. In addition, and unlike other projects in the area that have caused habitat fragmentation (including the Los Vaqueros Reservoir Project and Vasco Road Widening project), the Project will not introduce significant new barriers to dispersal at a regional level. Therefore, most of the regional habitat suitable for supporting populations of special-status species will be maintained in a relatively baseline condition, including maintaining habitat connectivity.

Other projects would be required individually to comply with applicable biological resource-related LORS, undergo a CEQA environmental review process, and implement mitigation for their identified impacts. Regional mitigation issues would be addressed and coordinated on a regional basis by local agencies, such as Alameda County and other interested stakeholders.

The cumulative impacts on specific environmental resources resulting from the Project considered together with other projects in the area also would be less than significant.

[2] Additional field surveys are scheduled for 2025 to verify the presence of any special-status plant species within BSA.

5.2.4 Mitigation Measures

The following sections describe generalized measures that are intended to avoid and minimize potential adverse effects of the Project on biological resources. Specific requirements to protect sensitive biological resources will be specified by CEC, CDFW, and USFWS, and will be followed by the Project proponents, as discussed in the following sections.

5.2.4.1 Biological Resources Mitigation Implementation and Monitoring Plan

The Applicant will submit the proposed Biological Resources Mitigation Implementation and Monitoring plan (BRMIMP) to the Compliance Project Manager (CPM) for review and approval, and to CDFW and USFWS for review and comment, and will implement the measures identified in the approved BRMIMP.

The final BRMIMP will identify:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the Applicant
2. All biological resources Conditions of Certification (COCs) identified in the Final EIR
3. All biological resources mitigation, monitoring, and compliance measures required in other state agency terms and conditions
4. All biological resources mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements
5. All sensitive biological resources to be impacted, avoided, or mitigated by Project construction, operation, and closure
6. All required mitigation measures for each special-status biological resource
7. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources
8. A detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities
9. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction
10. Aerial photographs of all areas to be disturbed during Project construction activities
11. Duration for each type of monitoring and a description of monitoring methodologies and frequency
12. Performance standards to be used to help decide if/when proposed mitigation is or is not successful
13. All performance standards and remedial measures to be implemented if performance standards are not met
14. A discussion of biological resources-related facility closure measures
15. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval
16. A copy of all biological resources permits obtained

5.2.4.2 Designated Biologist and Biological Monitors

The Applicant will submit to the CEC, CDFW, and USFWS the Designated Biologist(s) and Biological Monitor(s) qualifications before starting Covered Activities, and as otherwise required by the CEC, CDFW, and USFWS. The Designated Biologist would have full access to the site and hold stop work authority and would notify the agency representatives of non-compliance immediately. Failure to notify agency staff of any non-compliance or take or injury of a special-status species would be considered a violation of Project requirements.

5.2.4.3 Worker Environmental Awareness Program

The Applicant will conduct a WEAP for all persons employed or otherwise working within the Project area before performing any work. The program would consist of a presentation that includes a discussion of the biology and general behavior of the special-status species occurring in the Project area; information about the distribution and habitat needs of these species; sensitivity of these species to human activities; their statuses pursuant to ESA, CESA, and applicable California Fish and Game Codes (FGC), including legal protection, recovery efforts, and penalties for violations; and Project-specific protective measures.

5.2.4.4 General Design and Conservation Measures

The Applicant will incorporate all feasible measures and manage the construction site and related facilities to avoid or minimize impacts on local biological resources, which may include the following:

1. Design, install, and maintain wildlife exclusion fencing and/or other types of exclusion fencing, staking, signage, and flagging to avoid identified sensitive resources and preferentially use previously disturbed locations.

2. Avoid wetland loss to the greatest extent possible when placing facility features.

3. Design, install, and maintain facility lighting to minimize side casting of light toward wildlife habitat. Lighting on the Project site will be limited to areas required for safety, will be directed onsite to avoid backscatter, and will be shielded to the greatest extent practical. All lighting that is not required to be on during nighttime hours will be controlled with sensors or switches operated such that the lighting will be on only when needed.

4. Design, install, and maintain gen-tie steel pole structures, lines and all electrical components to reduce the likelihood of electrocutions of large birds by following *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

5. Vehicle and Equipment Cleaning. The spread of nonnative weeds during construction activities shall be controlled. All vehicles shall be cleaned and free of excessive mud and debris prior to arriving onsite.

6. SWPPP and Erosion Control. Prepare and implement a construction stormwater pollution prevention plan identifying BMPs to prevent fluid spills from endangering adjacent properties and waterways that contain sensitive habitat. Appropriate BMPs for erosion and sediment control shall be utilized to prevent sediment and construction debris from entering nearby streams, rivers, and watersheds. No monofilament shall be used for fiber rolls.

7. Install a temporary fence and provide wildlife escape ramps or covers for construction areas that contain steep walled holes or trenches if outside of an approved wildlife exclusionary fence. The temporary fence will be constructed of materials that are approved by USFWS and CDFW. All wildlife discovered in trenches will be allowed to escape voluntarily (by escape ramps or temporary structures), without harassment, before construction activities resume, or be removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

8. Environmentally Sensitive Area Demarcation. If surveys identify environmentally sensitive areas near work locations, the Applicant will clearly mark them for avoidance to the extent practicable.
9. Make certain all food-related trash is disposed of in closed containers and removed at least once a week.
10. Prohibit feeding of wildlife by staff or contractors.
11. Prohibit non-security related firearms or weapons from being brought to the site.
12. Prohibit pets from being brought to the site.
13. Minimize use of herbicides and prevent use of rodenticides in the BSA.
14. Advise all employees, contractors, and visitors of the need to adhere to speed limits and to avoid any wildlife, including burrowing owls and California tiger salamanders, which may be encountered on or crossing the roads to and from the BSA. The maximum speed on unpaved roads will be restricted to 15 miles per hour or lower during construction.
15. Inspect all construction pipes, culverts, or similar structures with a diameter of 4 inches or greater for special-status species (such as burrowing owls) prior to movement or burial of pipe. Cap all pipes with a diameter of 4 inches or greater if they are to be left in trenches overnight or in storage areas outside the construction laydown area.
16. Report all inadvertent deaths of special-status species to the appropriate Project representative. Injured wildlife will be reported to USFWS and CDFW and the Applicant will follow instructions that are provided by USFWS and CDFW. All incidences of wildlife injury or mortality resulting from Project-related vehicle traffic on roads used to access the Project will be reported as required.
17. Confine construction activities to the Project footprint, where feasible, to reduce the potential disruption associated with human presence within potentially occupied special-status species habitat.

5.2.4.5 Preconstruction Survey Plan

The Applicant will provide a preconstruction survey plan in the BRMIMP. Preconstruction surveys will be conducted by CEC-approved qualified biologists that may require additional agency approval to capture or handle special-status species. The CEC, in consultation with CDFW, the USFWS, and any other appropriate agencies, will determine the acceptability of the preconstruction survey protocols, the survey areas, avoidance buffer distance, relocation areas, and the Designated Biologist's prescriptions for potential impacts.

Prior to mobilization, the Applicant will conduct preconstruction surveys for:

- American badger
- Bald eagle
- Crotch's bumble bee
- Golden eagle
- Nesting birds protected by the MBTA
- Northwestern pond turtle
- Rare plants
- San Joaquin kit fox
- Swainson's hawk
- Tricolored blackbird

The Designated Biologist will make recommendations to the Applicant to avoid or minimize impacts on special-status species based on completed preconstruction surveys.

Burrowing Owl

The Applicant will survey for burrowing owl activities on the BSA prior to site mobilization to assess owl presence. The Applicant will evaluate the potential impact on each burrowing owl occurrence using impact criteria reviewed by the CDFW and USFWS and approved by the CEC. The impact criteria will be based on type of activity, length of activity, distance maintained from the burrowing owls, and time of year. For impact determinations that require monitoring of burrowing owls, a qualified biologist approved by the CEC must do the monitoring.

5.2.4.6 Construction Compliance Monitoring

The Applicant will perform monitoring throughout construction to ensure construction-related impacts remain at or below levels of significance set forth in the BRMIMP. Construction monitoring must include any special-status species located during the preconstruction survey and any areas identified as suitable habitat.

5.2.4.7 Compensatory Mitigation

To compensate for the temporary and permanent loss of nonnative annual grassland habitat (Table 5.2-6), the Applicant would offset these losses by either purchasing species credits from an approved offsite mitigation bank, or through the recordation of an agency-approved conservation easement. Compensation would occur at a ratio suitable for protection of covered species such as California tiger salamander, California red-legged frog, San Joaquin kit fox, burrowing owl, tricolored blackbird, and other species as required.

5.2.4.8 Restoration

The Applicant will restore nonnative annual grassland on all temporary disturbance areas.

5.2.4.9 USFWS Habitat Conservation Plan

The Applicant will provide a copy of the Habitat Conservation Plan per Section 10 of the ESA written by the USFWS. The terms and conditions contained in the Habitat Conservation Plan will be incorporated into the Project's BRMIMP.

5.2.5 Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local LORS applicable to biological resources are discussed in the following sections and summarized in Table 5.2-7.

5.2.5.1 Federal LORS

Clean Water Act of 1977

Title 33, United States Code (USC), Sections 1251 through 1376, and Code of Federal Regulations (CFR), Part 30, Section 330.5(a)(26), prohibit the discharge of dredged or fill material into the waters of the U.S. without a permit. The administering agency is the USACE.

Table 5.2-7. Laws, Ordinances, Regulations, and Standards for Biological Resources

LORS	Requirements/Applicability	Administering Agency	Application Section Explaining Conformance
Federal			
Clean Water Act (33 USC 1344)	Prohibits the discharge of dredged or fill material into the waters of the United States without a permit.	USACE	The Project is not anticipated to impact any waters of the United States (Section 5.2.2.2).
Federal ESA (16 USC 1531 et seq.)	Designates and protects federally threatened and endangered plants and wildlife and their critical habitat. Applicants for projects that could result in adverse impacts on any federally listed species are required to consult with and mitigate potential impacts in consultation with USFWS.	USFWS	The Project may potentially have adverse impacts on plants or wildlife that are federally listed as threatened or endangered (Section 5.2.2.2). Consultation with USFWS will be required. The Project will incorporate mitigation measures for potential impacts (Section 5.2.4).
MBTA (16 USC 703 to 711)	Protects all migratory birds, including nests and eggs.	USFWS	The Project will include mitigation measures to reduce impacts on resident and migratory birds to a less-than-significant level (Section 5.2.4).
Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668)	Prohibits take and disturbance of individuals and nests. Revised to authorize take with eagle take permits. In 2024, the USFWS revised its regulations for the issuance of eagle take permits, including those for incidental, disturbance and nest take. The revisions promulgate a general permitting system in addition to the existing individual or specific permits already available. These new regulations took effect April 12, 2024.	USFWS	On January 20, 2025, the White House issued a Secretary Order (SO 3415) ceasing issuance of all federal permits to wind energy pending internal review. This SO was amended (SO 3415 A1) on January 29, 2025. As of the time of preparation of this report, SO 3415 A1 remains in effect.
State			
CESA (FGC Section 2050 et seq.).	Species listed under this act cannot be "taken" or harmed, except under specific permit.	CEC	The Project will include mitigation measures to reduce impacts on state-listed species to a less-than-significant level (Section 5.2.4).
Title 14, California Code of Regulations (CCR), Sections 670.2 and 670.5	Lists wildlife designated as threatened or endangered in California.	CDFW	The Project may potentially have adverse impacts on state threatened or endangered wildlife (Section 5.2.2.2). Consultation with CDFW will be required. The Project will incorporate mitigation measures for potential impacts.

LORS	Requirements/Applicability	Administering Agency	Application Section Explaining Conformance
California Public Resources Code, Division 15, Chapter 6, Section 25527	Prohibits placing facilities within ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value.	CDFW	The Project is not located in an area protected by this code.
FGC Sections 3511, 4700, 5050, and 5515	Lists wildlife species that are FP in California.	CDFW	The Project will include mitigation measures to reduce impacts on CDFW FP species to a less-than-significant level (Section 5.2.4).
FGC Section 3503 and 3503.5	States that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 specifically protects birds of prey.	CDFW	The Project will include mitigation measures to reduce impacts on bird nests and eggs, including birds of prey, to a less-than-significant level (Section 5.2.4).
FGC Section 3513	Makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any migratory bird.	CDFW	The Project will include mitigation measures to reduce impacts on bird nests and eggs, to a less-than-significant level (Section 5.2.4).
FGC Sections 1930 et seq.	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.	CDFW	The Project is not located in an area protected by this code.
FGC Sections 2700 et seq.	Provides funding to the Wildlife Conservation Board and CDFW for acquisition, enhancement, restoration, and protection of areas that are most in need of proper conservation	CDFW	The Project is not located in an area protected by this code.
FGC Sections 1900 et seq.	The Native Plant Protection Act lists threatened, endangered, and rare plants listed by the state.	CDFW	Protocol-level rare plant surveys have not been completed, but no state-listed threatened, endangered, or rare plants are expected to be impacted by the Project (Section 5.2.2.2).
FGC (Sections 1601 through 1607)	Prohibits alteration of any stream, including intermittent and seasonal channels and many artificial channels, without a permit from CDFW.	CDFW	No streams, including intermittent and seasonal channels, will be impacted by the Project (Section 5.2.2.2).
Clean Water Act (33 USC 1341)	Requires the issuance of a clean water certification or waiver for any dredge/fill activities permitted under Section 404.	Regional Water Quality Control Board	The Project is not anticipated to impact any waters of the United States (Section 5.2.2.2).

LORS	Requirements/Applicability	Administering Agency	Application Section Explaining Conformance
Local			
Alameda County General Plan Conservation Element (Alameda County 1974)	Includes goal to protect and enhance wildlife habitats and natural vegetation areas	Alameda County	The Project would not result in significant impacts on wildlife, habitats, or other natural areas, as discussed in Sections 5.2.2.2 and 5.2.2.3.
Alameda County ECAP (Alameda County 1994)	Includes a goal and supporting policies to preserve a variety of plant communities and wildlife habitat.	Alameda County	The Project would not result in significant impacts on plant communities and wildlife habitat, as discussed in Section 5.2.2.2 Potential Impacts of Construction/Demolition and Section 5.2.2.3 Potential Impacts of Operation.
EACCS	Identifies conservation priorities and provides a framework for biological resource protection for projects in East Alameda County.	Alameda County	The Project will not conflict with the biological resource avoidance guidelines outlined by EACCS.

Endangered Species Act of 1973

Title 16, USC, Sections 1531 et seq., and Title 50, CFR, Parts 17.1 et seq., designate and provide for the protection of threatened and endangered plant and wildlife species and their critical habitat. The administering agency is the USFWS.

Migratory Bird Treaty Act

Title 16, USC, Sections 703 through 712, prohibit the taking of migratory birds, including nests with viable eggs. The administering agency is the USFWS. All native birds are protected under the MBTA.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668) prohibits take and disturbance of individuals and nests. Take permits for birds or body parts are limited to religious, scientific, or falconry pursuits. However, the BGEPA was amended in 1978 to allow mining developers to apply to USFWS for permits to remove inactive golden eagle nests in the course of "resource development or recovery" operations.

In 2009, USFWS issued the 2009 Final Rule on new permit regulations that allows take "for the protection of…other interests in any particular locality" and where the take is "associated with and not the purpose of an otherwise lawful activity…" (74 Federal Register [FR] 46836–46879). The 2009 Final Rule authorized programmatic take (take that is recurring and not in a specific, identifiable timeframe or location) of eagles only if avoidance measures have been implemented to the maximum extent achievable such that take was no longer avoidable.

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

In 2024, the USFWS revised its regulations for the issuance of eagle take permits, including those for incidental, disturbance and nest take. The revisions promulgate a general permitting system in addition to the existing individual or specific permits already available. These new regulations took effect April 12, 2024.

On January 20, 2025, the White House issued a Secretary Order (SO 3415) ceasing issuance of all federal permits to wind energy pending internal review. This SO was amended (SO 3415 A1) on January 29, 2025. As of the time of preparation of this report, SO 3415 A1 remains in effect.

5.2.5.2 State LORS

The administering agency for the state LORS is the CDFW. A Clean Water Act Section 401 certification from the Central Valley Regional Water Quality Control Board is not anticipated, as the Project is not expected to impact any jurisdictional waters.

California Endangered Species Act of 1984

CDFW Code Sections 2050 through 2098 protect California's rare, threatened, and endangered species. The Applicant will coordinate with CDFW to ensure conformance with CESA, and the CEC is expected to incorporate CDFW's requirements and concerns into the CEC COCs as needed.

California Code of Regulations

California Code of Regulations, Title 14, Division 1, Subdivision 3, Chapter 3, Sections 670.2 and 670.5, list plants and wildlife of California that are designated as rare, threatened, or endangered.

California Public Resources Code, Division 15, Chapter 6, Section 25527

This Public Resources Code (PRC) section prohibits placing facilities within ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value. The Project is not located in an area protected by this PRC section.

California Fish and Game Code, Fully Protected Species

FGC Sections 3511, 4700, 5050, and 5515 prohibit the taking of wildlife that are classified as fully protected in California.

California Fish and Game Code, Take, Possess, or Destroy Nests or Eggs

FGC Section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

California Fish and Game Code, Migratory Birds – Take or Possession

FGC Section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the MBTA or any part of such migratory non-game bird.

California Fish and Game Code, Significant Natural Areas

FGC Section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.

California Fish and Game Code, Wildlife and Natural Areas

FGC Section 2700 et seq. provides funding to the Wildlife Conservation Board and CDFW for acquisition, enhancement, restoration, and protection of areas that are most in need of proper conservation. These areas do not occur in the Project footprint.

California Fish and Game Code, Native Plant Protection Act of 1977

FGC Section 1900 et seq. designates state-listed rare, threatened, and endangered plants.

California Fish and Game Code Sections 1601 through 1607

FGC Sections 1601 through 1607 regulate activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Under new procedures, Streambed Alteration Agreement requirements would be incorporated in the CEC licensing

process, rather than through a separate agreement with CDFW. A Streambed Alteration Agreement is not anticipated for this Project.

Regional Water Quality Control Board Section 401 Certification

Under federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a water body must request state certification that the proposed activity will not violate state and federal water quality standards.

5.2.5.3 Local LORS

The administering agency for local LORS is Alameda County. Local approvals and permits are superseded by CEC approval of the Project under the Opt-In program. Projects permitted under the CEC's jurisdiction under the AB 205 Opt-In program are not subject to local agency requirements. The CEC may issue variances to local agency's ordinances when necessary.

Alameda County General Plan Conservation Element

Land use provisions included in every California city and county general plan (California State Planning Law, Government Code Section 65302 et seq.) reflect the goals and policies that guide the physical development of land in their jurisdiction. Alameda County General Plan Conservation Element includes goals and objectives for conservation of resources, including forests, soils, rivers and other waters, wildlife, and other natural resources (Alameda County 1974).

Alameda County East County Area Plan

The purpose of the ECAP is to present a clear statement of the County's intent concerning future development and resource conservation within East Alameda County. The ECAP includes goals and policies applicable to resources, including biological resources, in East Alameda County (Alameda County 1994).

East Alameda County Conservation Strategy

The EACCS is intended to provide an effective framework to protect, enhance, and restore natural resources in East Alameda County, while improving and streamlining the environmental permitting process for impacts resulting from infrastructure and development projects (ICF 2010). Although CEC certification supersedes local approvals, the Project will not conflict with the regional conservation goals outlined in the EACCS.

5.2.6 Agencies and Agency Contacts

Table 5.2-8 identifies agencies involved in Project biological resources-related resources permitting issues.

Table 5.2-8. Agency Contacts for Biological Resources

Issue	Agency	Contact Information
State-listed species	CDFW	Marcia Grefsrud 707-644-2812 2825 Cordelia Rd Ste 100, Fairfield, CA 94534 Marcia.Grefsrud@wildlife.ca.gov
State-listed species	CDFW	Brenda Blinn 707-944-5541 2825 Cordelia Rd Ste 100, Fairfield, CA 94534

Issue	Agency	Contact Information
		Brenda.Blinn@wildlife.ca.gov
Federally protected species	USFWS	Ryan Olah 916-414-6623 Sacramento USFWS Office. 2800 Cottage Way, W-2605 Sacramento, CA 95825 ryan.olah@fws.gov
Federally protected species, Eagle Liaison	USFWS	Heather Beeler 775-861-6304 Sacramento USFWS Office. 2800 Cottage Way, W-2605 Sacramento, CA 95825 heather.beeler@fws.gov

5.2.7 Permitting

The Project will not require any permits related to aquatic resources. The Project is expected to require a Habitat Conservation Plan in compliance with the ESA Section 10 consultation process. The application for certification process is in lieu of a CDFW 2081 ITP. However, the CEC certification is expected to include conditions and mitigation that would otherwise be requirements in a CDFW ITP.

5.2.8 References

Alameda County. 1974. *Conservation Element of the Alameda County General Plan*. Originally adopted November 23, 1974 and amended May 5, 1994. https://www.acgov.org/cda/planning/generalplans/documents/Conservation_Element_1994.pdf.

Alameda County. 1994. *East County Area Plan*. 1994. https://www.acgov.org/cda/planning/generalplans/documents/EastCountyAreaPlancombined.pdf.

American Wind Wildlife Institute (AWWI). 2018. Bats and Wind Energy: Impacts, Mitigation, and Tradeoffs.

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA. Battistone, Carie L., Brett J. Furnas, Richard L. Anderson, Julie L. Dinsdale, Kristi M. Cripe. 2022. "Population and Distribution of Swainson's Hawks (*Buteo swainsoni*) in California's Great Valley: A Framework for Long-Term Monitoring." Journal of Raptor Research. 53(3). pp. 253–265.

Bechard, M.J., C.S. Houston, J.H. Sarasola, and A.S. England. 2020. "Swainson's Hawk (*Buteo swainsoni*)." Version 1.0. In Birds of the World (A.F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.swahaw.01.

Bulger, J.B., N.J. Scott, Jr., and R.B. Seymour. 2003. "Terrestrial Activity and Conservation of Adult California Red-legged Frogs (*Rana aurora draytonii*) in Coastal Forests and Grasslands." Biological Conservation. Vol. 110. pp. 85-95.

Calflora. 2025. *What Grows Here*. www.calflora.org. https://www.calflora.org/entry/wgh.html.

California Consortium of Herbaria 2 (CCH2) Portal. 2025. https://www.cch2.org/portal/index.php. Accessed on February 15.

California Department of Fish and Game (CDFG). 2005. California Wildlife Habitat Relationships System. May 2025. https://wildlife.ca.gov/Data/CWHR/Wildlife-Habitats#habitat-types.

California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation. March 7.

California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. March 20. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline.

California Department of Fish and Wildlife (CDFW). 2025a. Biogeographic Information and Observation System. Available online: https://apps.wildlife.ca.gov/bios6/.

California Department of Fish and Wildlife (CDFW). 2025b. Special Animals List. California Natural Diversity Database (CNDDB). April. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline.

California Department of Fish and Wildlife (CDFW). 2025c. California Natural Community List. June. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline.

California Department of Fish and Wildlife (CDFW). 2025d. Areas of Conservation Emphasis (ACE). April, 2025. https://wildlife.ca.gov/Data/Analysis/ACE.

California Department of Parks and Recreation (State Parks). 2025. Bethany Reservoir State Recreation Area. May 2025. https://www.parks.ca.gov/pages/562/files/BethanyReservoirSRAWebLayout2020rev.pdf.

California Invasive Plant Council (Cal-IPC). 2025. California Invasive Plant Inventory Database. California Invasive Plant Council, Berkeley. Available at: https://www.cal-ipc.org/.

California Native Plant Society (CNPS). 2025a. Inventory of Rare and Endangered Plants of California. Online query available at: https://rareplants.cnps.org/.

California Native Plant Society (CNPS) 2025b. California's Vegetation. Online query available at: https://vegetation.cnps.org/.

California Protected Areas Database (CPAD). 2025. CPAD + CCED, California's Protected Areas. April, 2025. https://calands.org/.

Center for Biological Diversity, Defenders of Wildlife, Burrowing Owl Preservation Society, Santa Clara Valley Audubon Society, Urban Bird Foundation, Central Valley Bird Club, San Bernardino Valley Audubon Society. 2024. Petition to List California Populations of the Western Burrowing Owl (*Athene cunicularia hypugaea*) as Endangered or Threatened Under the California Endangered Species Act. California Fish and Game Commission. March 5.

Contra Costa Water District (CCWD). 2025. About Los Vaqueros Reservoir. May 2025. https://www.ccwater.com/152/About-Los-Vaqueros.

Cornell Lab of Ornithology. 2024. *Merlin*. Mobile application. Cornell Lab of Ornithology, Ithaca, New York. https://merlin.allaboutbirds.org/.

East Bay Regional Park District (EBRPD). 2025a. Brushy Peak Regional Preserve. May 2025. https://www.ebparks.org/parks/brushy-peak.

East Bay Regional Park District (EBRPD). 2025b. Measure WW Regional Open Space, Shoreline and Parks Bond Extension. May 2025. https://www.ebparks.org/sites/default/files/Measure-WW-RegOpenSpaceWildlifeShorelineParksBondExtProjectsMap_0.pdf.

eBird. 2025. "eBird: An Online Database of Bird Distribution and Abundance." Web application. eBird, Cornell Lab of Ornithology, Ithaca, New York. Accessed January-April 2025. http://www.ebird.org.

East Contra Costa County Habitat Conservancy (ECCCHC). 2025. East Contra Costa County Habitat Conservancy Overview and History. May 2025. https://cocohcp.org/196/Overview-History.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y 87 1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A176 912. http://www.cpe.rutgers.edu/Wetlands/1987-Army-Corps-Wetlands-Delineation-Manual.pdf.

ESRI. 2025. *World Imagery*. ArcMap Software Version 10.8.1.14362. Accessed January 2025.

Furnas, Brett J., David H. Wright, Erin N. Tennant, Reagen M. O'Leary, Michael J. Kuehn, Peter H. Bloom, and Carie L. Battistone. 2022. Rapid growth of the Swainson's Hawk population in California since 2005. Ornithological Applications. Volume 124, Issue 2. May 5. https://doi.org/10.1093/ornithapp/duac006.

Hansen, Robert W. and Jackson D. Shedd. 2025. *California Amphibians and Reptiles*. Princeton University Press.

Hatfield, R., S. Colla, S. Jepsen, L. Richardson, R. Thorp, and S. Foltz Jordan. 2014. "IUCN Assessments for North American Bombus spp." North American IUCN Bumble Bee Specialist Group. The Xerces Society for Invertebrate Conservation, Portland, OR.

Hatfield, R., S. Jepsen, S.F. Jordan, M. Blackburn, and A. Code. 2018. A Petition to the State of California Fish and Game Commission to List the Crotch bumble bee (*Bombus crotchii*), Franklin's bumble bee (*Bombus franklini*), Suckley cuckoo bumble bee (*Bombus suckleyi*), and western bumble bee (*Bombus occidentalis occidentalis*) as Endangered under the California Endangered Species Act.

ICF International (ICF). 2010. East Alameda County Conservation Strategy. Final. October. (ICF 00906.08.) San Jose, CA. Prepared for East Alameda County Conservation Strategy Steering Committee, Livermore, CA.

iNaturalist. 2025. Web application. Accessed February 2025. https://www.inaturalist.org.

Jacobs Engineering Group Inc. (Jacobs). 2025. *Viracocha Hill BESS Project – Biological Study Area Surveys*.

Jepson Flora Project (eds.) 2025. Jepson eFlora. Available online: http://ucjeps.berkeley.edu/eflora/.

Miles, Scott, and Charles Goudey, eds. 1998. *Ecological Subregions of California. United States Department of Agriculture, Forest Service*. Pacific Southwest Division. R5-EM-TP-005-Net.

Morris, J.T. 1991. "Effects of Nitrogen Loading on Wetland Ecosystems with Particular Reference to Atmospheric Deposition." *Annual Review of Ecology and Systematics*. Vol. 22: 257-279.

Mountain House, City of. 2025. The Native Vegetation of Mountain House Creek. May. https://www.mountainhouseca.gov/home/showpublisheddocument/1522/637565237241000000.

Natural Resources Conservation Service (NRCS). 2025. Web Soil Survey 2.0 National Cooperative Soil Survey. Accessed March 13, 2025. http://websoilsurvey.nrcs.usda.gov/app/.

San Joaquin Council of Governments (SJCOG). 2025. Habitat Program. May. https://www.sjcog.org/94/Habitat.

Scobie, D., and C. Faminow. 2000. Development of standardized guidelines for petroleum industry activities that affect COSEWIC Prairie and Northern Region vertebrate species at risk. Environment Canada, Prairie and Northern Region, Edmonton, Alberta, Canada.

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in

California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

State Water Resources Control Board. 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. April.

Swainson's Hawk Technical Advisory Committee (SHTAC). 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Survey's in California's Central Valley.

U.S. Army Corps of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). ERDC/EL TR-08-28. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

U.S. Army Corps of Engineers (USACE). 2018. National Wetland Plant List, version 3.4. U.S. Army Corps of Engineers Engineer Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. https://nwpl.sec.usace.army.mil/.

U.S. Army Corps of Engineers (USACE). 2025. *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams* (*Final Version*).

U.S. Fish and Wildlife Service (USFWS). 1996. Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants. Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS). 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Region 1, U.S. Fish and Wildlife Service, Portland, OR. 319 pp.

U.S. Fish and Wildlife Service (USFWS). 2010a. "Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the California Red-Legged Frog (*Rana aurora draytonii*) Final Rule." *Federal Register* 75(51):12816- 12959.

U.S. Fish and Wildlife Service (USFWS). 2010b. San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation. Sacramento, CA, Sacramento Fish and Wildlife Office.

U.S. Fish and Wildlife Service (USFWS). 2020. Eagle Nest Survey Guidance Updated Protocol. April 21, 2020. Available online: https://www.fws.gov/sites/default/files/documents/eagle-nest-survey-guidance-updated-protocol.pdf.

U.S. Fish and Wildlife Service (USFWS). 2025a. National Wetlands Inventory Map. Accessed March 13, 2025. http://www.fws.gov/wetlands/Data/Mapper.html.

U.S. Fish and Wildlife Service (USFWS). 2025b. Information for Planning and Consultation (IPaC) website. U.S. Department of the Interior, Washington, DC. Available online: https://ipac.ecosphere.fws.gov/.

U.S. Geological Survey (USGS). 2025a. National Hydrography Dataset. Accessed March 13, 2025. https://www.usgs.gov/core-science-systems/ngp/national-hydrography.

U.S. Geological Survey (USGS). 2025b. Topoview. United States Department of the Interior. Accessed March 13, 2025. https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06.

Western Monarch Milkweed Mapper. 2025. https://www.monarchmilkweedmapper.org/. Accessed April 24, 2025.

Western Regional Climate Center (WRCC). 2025. Recent Climate in The West. Tracy Pumping Plant, California (049001). https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9001.

Williams, P.H., R.W. Thorp, L.L. Richardson, and S.R Colla. 2014. Bumble bees of North America: an Identification Guide. March. Princeton University Press. 208 pp.

Xerces Society, The. 2018. Managing for Monarchs in the West: Best Management Practices for Conserving the Monarch Butterfly and its Habitat. 106+vi pp. Portland, OR: The Xerces Society for Invertebrate Conservation. (Available online at www.xerces.org).

5.3 Cultural Resources

Section 5.3 Cultural Resources was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.4 Geological Hazards and Resources

Section 5.4 Geological Hazards and Resources was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.5 Hazardous Materials Handling

Section 5.5 Hazardous Materials Handling was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.6 Land Use

Section 5.6 Land Use was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.7 Noise

This section presents an assessment of potential noise effects related to the Viracocha Hill battery energy storage system project (Viracocha Hill BESS or Project). Section 5.7.1 discusses the fundamentals of acoustics. Section 5.7.2 describes the affected environment, including baseline noise level survey methodology and results. Section 5.7.3 presents an environmental analysis of the construction and operation of the BESS yard and associated facilities. Section 5.7.4 discusses cumulative effects. Section 5.7.5 discusses mitigation measures. Section 5.7.6 presents applicable laws, ordinances, regulations, and standards (LORS). Section 5.7.7 presents agency contacts, and Section 5.7.8 presents permit requirements and schedules. Section 5.7.9 contains the references used to prepare this section.

5.7.1 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Acoustical terms used in this section are summarized in Table 5.7-1.

Table 5.7-1. Definitions of Acoustical Terms

Term	Definition
Ambient noise level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the L_{eq} level.
Background noise level	The underlying ever-present sound level that remains in the absence of intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L_{90} percentile noise level (L_{90} represents the sound pressure level that is exceeded during 90% of the measurement period).
Sound pressure level decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-weighted sound pressure level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear, and generally correlates well with subjective reactions to environmental sounds. All sound levels in this report are A-weighted.
Equivalent sound pressure level (L_{eq})	The average A-weighted sound pressure level, on an equal energy basis, during the measurement period.
Percentile sound pressure level (L_n)	The sound pressure level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (for example, L_{90}).
Community noise equivalent level (CNEL)	The average A-weighted noise level during a 24-hour day, based on the L_{eq} plus 5 decibels from 7:00 p.m. to 10:00 p.m. and L_{eq} plus 10 decibels from 10:00 p.m. to 7:00 a.m.

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to the way in which a person perceives or hears sound.

A-weighted sound levels are typically measured or presented as equivalent sound pressure level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time and is commonly used to measure steady-state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by $L_{xx,}$ where xx represents the percentile of time the sound level is exceeded. L_{90} is a measurement that represents the noise level that is exceeded during 90% of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10% of the measurement period.

Some metrics used in determining the impact of environmental noise consider the differences in response that people have to daytime and nighttime noise levels. During the nighttime, exterior background noises are generally lower than the 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 nighttime noise levels, the CNEL was developed. CNEL is a noise index that accounts for the greater potential annoyance of noise during the evening and nighttime hours.

CNEL values are calculated by averaging hourly L_{eq} sound levels for a 24-hour period and apply a weighting factor to nighttime L_{eq} values. The weighting factor, which reflects the increased sensitivity to noise during nighttime hours, is added to each hourly L_{eq} sound level before the 24-hour CNEL is calculated. For the purposes of assessing noise, the 24-hour day is divided into three time periods with the following weightings:

- Daytime: 7:00 a.m. to 7:00 p.m. (12 hours); weighting factor of 0 dB
- Evening: 7:00 p.m. to 10:00 p.m. (3 hours); weighting factor of 5 dB
- Nighttime: 10:00 p.m. to 7:00 a.m. (9 hours); weighting factor of 10 dB

The three time periods are then averaged to compute the overall CNEL value. For a continuous noise source, the CNEL value is easily computed by adding 6.7 dB to the overall 24-hour noise level (L_{eq}). For example, if the expected continuous noise level from a power plant were 60.0 dBA, then the resulting CNEL from the plant would be 66.7 dBA.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily attributable to the wide variation in individual thresholds of annoyance and habituation to noise.

Table 5.7-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

Table 5.7-2. Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
Shotgun (at shooter's ear)	140	Carrier flight deck	Painfully loud
Civil defense siren (100 feet)	130		
Jet takeoff (200 feet)	120		Threshold of pain
Loud rock music	110	Rock music concert	
Pile driver (50 feet)	100		Very loud
Ambulance siren (100 feet)	90	Boiler room	
Pneumatic drill (50 feet)	80	Noisy restaurant	
Busy traffic; hair dryer	70		Moderately loud
Normal conversation (5 feet)	60	Data processing center	
Light traffic (100 feet); rainfall	50	Private business office	
Bird calls (distant)	40	Average living room, library	Quiet
Soft whisper (5 feet); rustling leaves	30	Quiet bedroom	
	20	Recording studio	
Normal breathing	10		Threshold of hearing

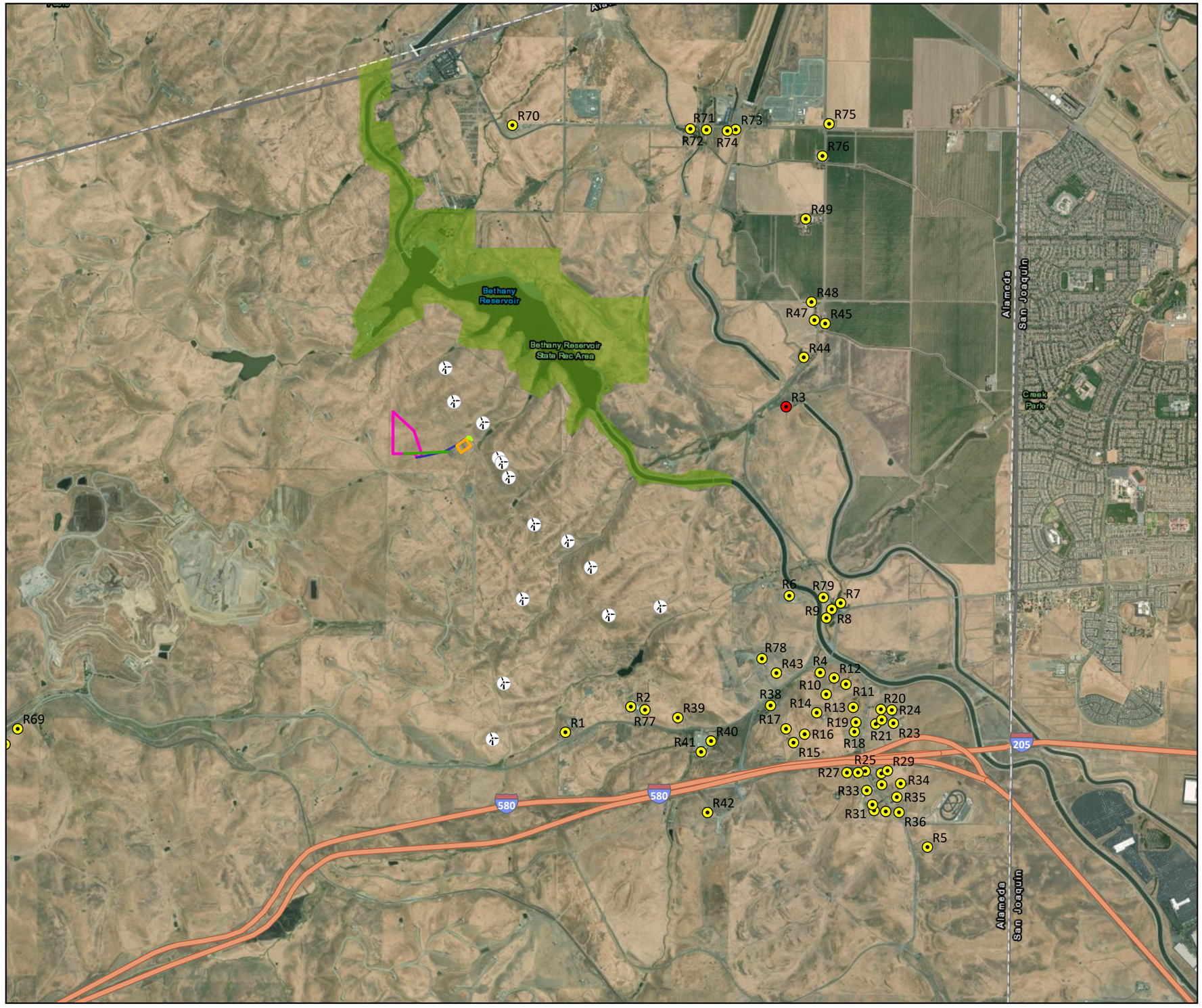
Source: Beranek 1998

5.7.2 Affected Environment

5.7.2.1 Local Land Use and Noise Sources

The Project study area is located within unincorporated Alameda County (County). The proposed site is located within the Altamont Pass, approximately 0.8 mile southwest of the Bethany Reservoir. The city limits of Tracy, California, are 3.3 miles east of the Project site. Existing land use at the Project site is undeveloped farmland surrounded by an operating wind power generation facility that appears to have undergone repowering upgrades since the early 2000s. The Project site is within the Alameda County *East County Area Plan*'s Large Parcel Agriculture land use designation (Alameda County 2000). The zoning designation is Agriculture-Combining B District. Refer to Figure 5.6-2 for zoning designations surrounding the Project site. The surrounding area includes the Altamont Landfill to the west, and the Bethany Reservoir to the north, and operating farmland to the east.

The closest residence to the Project site is an isolated residence located approximately 1.8 miles to the east (Figure 5.7-1). The Bethany Reservoir is identified as a recreation area and is located approximately 0.5 mile to the northwest of the Project site. Additional residences are located east and southeast of the Project site.



Legend

- Residences
- Closest Residence
- Turbine
- Proposed 230-kV Gen-Tie
- Proposed Road Improvement Area
- Proposed Improvements to Existing Access Road
- Proposed Alternate Substation Area
- Viracocha BESS Equipment Yard
- Recreation Area
- Interstate Highway

Source:
1) ESRI Aerial Images

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Figure 5.7-1
Nearby Noise Receptors
Viracocha BESS Project
Alameda County, California

Jacobs

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5.7.2.2 Ambient Sound Levels

Annex C of the American National Standards Institute (ANSI) Standard S12.9-2013, *Quantities and Procedures for Description and Measurement of Environmental Sound—Part 3: Short-term Measurements with an Observer Present* (Annex C ANSI Standard S12.9-2013) (ANSI 2013) provides estimated day-night, day, and night sound levels based on land use category. These estimates can be used to provide a general indication of ambient sound in the Project study area.

Existing ambient sound levels may vary both temporally and spatially. For example, wind may result in rustling vegetation noise or wind turbine operations on one day whereas calm conditions on another day would result in different sound levels, even at the same location. Seasonal activities can also result in different sound levels. Annex C ANSI Standard S12.9-2013 provides a table of approximate background sound levels based on land use and population density. The ANSI standard estimation divides land uses into six distinct categories. Descriptions of these land use categories, along with the typical day and night levels, are provided in Table 5.7-3. Of the six categories, the closest residence to Project site is located to the east and would fall under Category 6, where sound levels would be expected to range between 34 and 40 dBA. However, this residence and others nearby east and southeast of the Project site are close to the Interstate Highway, thus higher ambient sound levels are anticipated. Ambient sound levels will also be increased by noise from the Sand Hill Wind Project east and southeast of the Project. At times, louder or quieter periods than the levels stated could reasonably be assumed to occur. Furthermore, Annex C ANSI Standard S12.9-2013 notes the "95% prediction interval (confidence interval) is on the order of ±10 dB."

Table 5.7-3. A-Weighted Sound Levels Corresponding to Land Use and Population Density

Category	Land Use	Description	People per Square Mile	Day (dBA)	Night (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

Category	Land Use	Description	People per Square Mile	Day (dBA)	Night (dBA)
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, few if any near sources of sound exist.	200	40	34

Source: ANSI 2013

5.7.3 Environmental Analysis

Noise will be produced during the construction and operation of the Project. Potential noise impacts from construction and operation activities are assessed in this subsection.

5.7.3.1 Significance Criteria

Following the California Environmental Quality Act (CEQA) guidelines (Title 14, California Code of Regulations [CCR], Appendix G, Section XI), the Project would cause a significant impact if it would result in the following:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive ground-borne vibration or ground-borne noise levels.

Generally, the design basis for noise control is the minimum, or most stringent, noise level required by any of the applicable LORS. Therefore, noise from the Project is evaluated against Alameda County requirements. The County has established quantitative planning guidelines for various land uses in the Noise Element of its General Plan and has established exterior noise level limits for receiving residential and commercial properties in the County Code. An exception for noise sources from construction is established in the County Code for specific daytime hours.

5.7.3.2 Construction Impacts

Project Construction Noise

Construction of the Project is expected to be generally similar in terms of activities and equipment to that of other BESS facilities. The construction schedule will maintain hours consistent with the County's noise code, with noisy construction activities not taking place before 7:00 a.m. or after 7:00 p.m. on week days, or before 8:00 a.m. or after 5:00 p.m. on Saturday or Sunday. The noise level will vary during the construction period depending on the construction phase. Construction of power plants can generally be divided into the following five phases that use different types of construction equipment:

demolition, site preparation, and excavation; concrete pouring; steel erection; mechanical; and cleanup (Miller, Wood, Hoover, Thompson, Thompson, and Paterson 1978).

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control and the Empire State Electric Energy Research Company studied noise from individual pieces of construction equipment, as well as from construction sites of power plants and other types of facilities (EPA 1971; Barnes. Miller, and Wood 1976). Because specific information on types, quantities, and operating schedules of construction equipment is not available at this point in Project development, information from these documents for similarly sized industrial projects will be used.

The loudest equipment types generally operating at a site during each phase of construction are presented in Table 5.7-5. The composite average or equivalent site noise level, representing noise from all equipment, is also presented for each phase.

Table 5.7-5. Construction Equipment and Composite Site Noise Levels

Construction Phase	Loudest Construction Equipment	Equipment Noise Level (dBA) at 50 Feet	Composite Site Noise Level (dBA) at 50 Feet
Demolition, Site Clearing, and Excavation	Dump Truck Backhoe	91 85	89
Concrete Pouring	Truck Concrete Mixer	91 85	78
Steel Erection	Derrick Crane Jack Hammer	88 88	87
Mechanical	Derrick Crane Pneumatic Tools	88 86	87
Cleanup	Rock Drill Truck	98 91	89

Sources: EPA 1971; Barnes, Miller, and Wood 1976

Average or equivalent construction noise levels projected at various distances from the site are presented in Table 5.7-6. These results are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air. Over large distances sound levels are further reduced by both air and ground absorption. Table 5.7-7 presents noise levels from common construction equipment at various distances.

Table 5.7-6. Average Construction Noise Levels at Various Distances

Construction Phase	Sound Pressure Level (dBA)		
	375 feet	1,500 feet	3,000 feet
Demolition, Site Clearing, and Excavation	71	59	53
Concrete Pouring	60	48	42
Steel Erection	69	57	51
Mechanical	69	57	51
Cleanup	71	59	53

Table 5.7-7. Noise Levels from Common Construction Equipment at Various Distances

Construction Equipment	Typical Sound Pressure Level at 50 feet (dBA)	Typical Sound Pressure Level at 375 feet (dBA)	Typical Sound Pressure Level at 1,500 feet (dBA)
Pile Drivers (20,000 to 32,000 ft-lb/blow)	104	86	74
Dozer (250 to 700 hp)	88	70	58
Front End Loader (6 to 15 yd^3)	88	70	58
Trucks (200 to 400 hp)	86	68	56
Grader (13- to 16-foot blade)	85	67	55
Shovels (2 to 5 yd^3)	84	66	54
Portable Generators (50 to 200 kW)	84	66	54
Derrick Crane (11 to 20 tons)	83	65	53
Mobile Crane (11 to 20 tons)	83	65	53
Concrete Pumps (30 to 150 yd^3)	81	63	51
Tractor (0.75 to 2 yd^3)	80	62	50
Unquieted Paving Breaker	80	62	50
Quieted Paving Breaker	73	55	43

cu yd = cubic yard
ft-lb/blow = foot pound(s) per blow
hp = horsepower
kW = kilowatt(s)
yd^3 = cubic yard(s)

Federal Transit Administration's (FTA's) *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) represents the most recent and comprehensive tabulation of sound from common pieces of construction equipment. Representative sound levels from the FTA (2018) manual are presented in Table 5.7-8. These FTA data are generally consistent with the data presented in Tables 5.7-5 through 5.7-7.

Table 5.7-8. FTA Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level 50 Feet from Source, dBA	Equipment	Typical Noise Level 50 Feet from Source, dBA
Air Compressor	80	Loader	80
Backhoe	80	Paver	85
Compactor	82	Pneumatic Tool	85
Concrete Mixer	85	Pump	77
Concrete Pump	82	Roller	85
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83

Equipment	Typical Noise Level 50 Feet from Source, dBA	Equipment	Typical Noise Level 50 Feet from Source, dBA
Crane, Mobile	83	Scraper	85
Dozer	85	Shovel	82
Generator	82	Jack Hammer	88
Grader	85	Truck	84
Impact Wrench	85		

Source: FTA 2018, Table 7-1.

A review of construction equipment noise emission levels presented in Tables 5.7-8 through 5.7-10 indicates that the loudest equipment generally emits noise of approximately 80 to 90 dBA at 50 feet.

Sound levels at any specific receptor are dominated by the closest and loudest equipment. The types, numbers, and duration of equipment anticipated to be used during construction near any specific location will vary over time. An estimated construction sound level near a specific activity area may be based on the assumptions of multiple pieces of loud equipment operating in close proximity of each other, such as the following:

- One piece of equipment generating a reference noise level of 85 dBA located 50 feet at the edge of the construction activity.
- Two pieces of equipment generating reference noise levels of 85 dBA located 50 feet farther away from the edge of construction.
- Two more pieces of equipment generating reference noise levels of 85 dBA located 100 feet farther away from the edge of construction.

As described by FTA, the average noise level from each piece of equipment is determined by the following formula for geometric spreading:

$$\textit{Typical Noise Level at 50 feet} + 10 \times \log (Adj_{usage}) - 20 \times \log (\textit{distance to receptor}/50) - 10 \times G \times \log (\textit{distance to receptor}/50)$$

Using a usage factor (Adj_{usage}) of 1 (that is, all equipment is operating simultaneously at its rated sound level of 85 dBA) and ground effect factor (G) of 0, representing hard ground (that is, pavement, a ground condition that does not result in additional attenuation) yields a conservative calculation. A usage factor of 0.5 and ground factor of 0.5 (more acoustical absorptive ground surface such as dirt) is expected to yield a more typical result. Average construction noise levels at various distances, based on these scenarios, are presented in Table 5.7-9.

Table 5.7-9. Average Construction Equipment Noise Levels Versus Distance (dBA)

Distance from Construction Activity (feet)	Usage Factor = 1 and G = 0	Usage Factor = 0.5 and G = 0.5
50	87	84
100	83	78
200	78	72
400	73	65
800	67	58

Distance from Construction Activity (feet)	Usage Factor = 1 and G = 0	Usage Factor = 0.5 and G = 0.5
1,600	62	51
3,200	56	44

Noise generated during the testing and commissioning phase of the Project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops of the emergency equipment are more frequent during this period, but they are usually short-lived.

Construction Vibration

Construction vibrations can be divided into three classes based on the wave form and its source (Table 5.7-10). Pile driving is typically the construction activity with the greatest potential to generate ground vibrations. These vibrations attenuate rapidly with distance to less than typical criteria for sensitive structures within 200 feet. However, although pile driving is not proposed for the Project, to meet completeness requirements the Applicant is providing the following discussion on pile driving impacts.

As pile driving is not proposed as part of the Project, construction methods less likely to result in ground vibrations will be used. In addition, the closest residence is over 1 mile away. Given these factors, mitigation for construction vibration is not required.

Table 5.7-10. Construction Residence Vibrations

Wave Form	Example Source
Impact	Impact pile driver or blasting
Steady-state	Vibratory pile driver
Pseudo steady-state	Double acting pile hammer

Worker Exposure to Noise

Worker exposure levels during construction of the Project will vary depending on the phase of the Project and the proximity of the workers to the noise-generating activities. The Project will develop a Hearing Protection Plan, which complies with California Division of Occupational Safety and Health Administration (Cal/OSHA) requirements. This Hearing Protection Plan will be incorporated into the Project's construction Health and Safety Plan. The plan will require appropriate hearing protection for workers and visitors throughout the duration of the construction period.

5.7.3.3 Operational Impacts

Worker Exposure

Nearly all components will be specified not to exceed near-field maximum noise levels of 90 dBA at 3 feet or 85 dBA at 3 feet where available as a vendor standard. No permanent or semi-permanent workstations are located near any piece of noisy Project equipment. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA. The Project will comply with applicable Cal/OSHA requirements. Outdoor levels throughout the Project will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source.

Transmission Line and Switchyard Noise Levels

One of the electrical effects of high-voltage gen-tie lines is corona. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware attributable to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Corona is generally a concern with gen-tie lines of 345 kilovolts and greater and with lines that are at higher elevations. Corona noise is also generally associated with foul weather conditions. Because the Project will be connected at the 230-kilovolt level, it is expected that no corona-related design issues will be encountered.

Project Operational Noise Modeling

A preliminary noise model of the proposed Project has been developed using the CadnaA noise model by DataKustik GmbH of Munich, Germany. The sound propagation factors used in the model have been adopted from International Organization for Standardization (ISO) 9613-2 *Acoustics—Sound Attenuation During Propagation Outdoors* (Part 2: General Method of Calculation) (ISO 1996). Atmospheric absorption was estimated for conditions of 10 degrees Celsius and 70% relative humidity (conditions that favor propagation) and computed in accordance with ISO 9613-1 *Acoustics—Sound Attenuation During Propagation Outdoors* (Part 1: Calculation of the Absorption of Sound by the Atmosphere) (ISO 1993). The ISO 9613-2 parameters used in this assessment are a receptor height of 1.5 meters and hard ground (G = 0.0, where G may vary between zero for hard pavement or water and one for acoustically absorptive ground such as plowed earth) for the Project site and mixed ground (G = 0.5) for the surrounding area given its predominately agricultural uses.

Modeling is based on anticipated BESS equipment sound levels of 75 dBA at 10 meters. As indicated in Section 5.7.6.3 the County's most restrictive limit is a nighttime limit of 45 dBA at the closest residence. Given the large distances to the closest residences the Project is predicted to comply. As the Project design and equipment specifications are refined during detailed design, potential noise minimization measures will be considered if necessary and appropriate to comply with the County limit and conditions of certification.

Sound levels during maintenance activities may vary but are generally anticipated to consist of pickup truck noise and the infrequent use of some construction equipment.

Tonal Noise

Project equipment specifications will be developed such that significant tones would not be anticipated at the distant isolated residential uses.

Ground and Airborne Vibration

The equipment that would be used in the Project are not known sources of perceptible vibration. Fans and ventilation systems are expected to be well balanced and designed to produce very low vibration levels throughout the life of the Project.

5.7.4 Cumulative Effects

A cumulative impact refers to a proposed Project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed Project (Public Resources Code Section 21083; Title 14, CCR, Sections 15064(h), 15065(c), 15130, and 15355).

The Project will involve the construction and operation of the up to 362.8-megawatts-per-hour Viracocha Hill battery energy storage system project (Viracocha Hill BESS or Project) in Alameda County, California, adjacent to the proposed Sand Hill Wind Repower project. The Project will be

located on a 443-acre parcel (Assessor's Parcel Number 99B-7300-1-5) and will consist of a 17-acre area that will include an approximately 14-acre BESS yard, laydown area, substation, and retention pond. The exact design and location of these features will be refined as the Project moves forward. Additionally, the Project includes improvements to a 0.3-mile-long access road, a 0.15-acre road improvement, and an approximately 1,325-foot-long gen-tie line connecting to the Ralph Substation. If expanding the Ralph Substation is unavailable, a new switching station or a line-tap will be developed adjacent to the existing substation.

The closest permanent residence is located approximately 1.2 miles north of the Project on the opposite side of the Bethany Reservoir. The overall sound level is strongly dependent on the closest noise source. While the precise level of any potential increase depends on how far projects are from a sensitive receptor, when considering the potential cumulative influence of two sources at a receptor, the maximum cumulative increase is 3 dBA. This Project is over 1 mile from the closest residence. This Project, as well as future projects, will be subject to LORS intended to minimize or avoid significant cumulative impacts.

Significant long-term cumulative impacts are not anticipated with the implementation of the Project and the listed cumulative projects because each project is required to comply with CEQA guideline requirements for evaluating potential cumulative impacts, and/or to obtain approval from the Lead Agency before permitting and construction by demonstrating conformance with existing land use policies. For these reasons, the Project will not cause a significant cumulative noise impact.

5.7.5 Mitigation Measures

In addition to the attenuation measures incorporated into the design and discussed in this section, the Project proposes to implement the following measures to minimize any potential noise impacts.

5.7.5.1 Noise Hot Line

The Applicant will establish a telephone number for use by the public to report any significant undesirable noise conditions associated with the construction and operation of the Project. If the telephone is not staffed 24 hours per day, the Project owner will include an automatic answering feature with date and time stamp recording to answer calls when the phone is unattended. This telephone number will be posted at the Project site during construction in a manner visible to passersby. This telephone number will be maintained until the Project has been operational for at least 1 year.

5.7.5.2 Noise Complaint Resolution

Throughout Project construction and operation, the Project owner will document, investigate, evaluate, and attempt to resolve all legitimate Project-related noise complaints.

The Applicant or authorized agent will do the following:

- Use the Noise Complaint Resolution Form typically suggested by California Energy Commission or a functionally equivalent procedure to document and respond to each noise complaint.
- Attempt to contact the person(s) making the noise complaint within 24 hours.
- Conduct an investigation to attempt to determine the source of noise related to the complaint.
- If the noise complaint is legitimate, take all feasible measures to reduce the noise at its source.

5.7.6 Laws, Ordinances, Regulations, and Standards

Table 5.7-11 presents the LORS that apply to noise.

Table 5.7-11. Laws, Ordinances, Regulations, and Standards for Noise

LORS	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Federal			
EPA	Guidelines for state and local governments.	EPA	5.7.6.1
Occupational Safety and Health Act of 1970	Exposure of workers over 8-hour shift limited to 90 dBA.	Occupational Safety and Health Administration	5.7.6.1
State			
Cal/OSHA, Title 8 CCR Article 105 Section 095 et seq.	Exposure of workers over 8-hour shift limited to 90 dBA.	Cal/OSHA	5.7.6.2
California Vehicle Code Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.	Caltrans, California Highway Patrol, and the appropriate County Sheriff's Office	5.7.6.2
Local			
California Government Code Section 65302	Requires local government to prepare plans that contain noise provisions.	California Office of Planning and Research	5.7.6.3
East County Area Plan	The General Plan provides quantitative compatibility goals, policies, and implementation programs.	Alameda County	5.7.6.3
Alameda County, California, Municipal Code	The Municipal Code includes exterior noise level standards for receiving residential and commercial properties, as well as an exception for construction noise occurring between 7:00 a.m. and 7:00 pm. Monday through Friday, or between 8:00 a.m. and 5:00 p.m. on Saturday or Sunday.	Alameda County	5.7.6.3

5.7.6.1 Federal LORS

EPA

Guidelines are available from the EPA (1974) to assist state and local government entities in development of state and local LORS for noise. Because there are local LORS that apply to this Project, these guidelines are not applicable.

Occupational Safety and Health Administration

Onsite noise levels are regulated through the OSHA. The noise exposure level of workers is regulated at 90 dBA over an 8-hour work shift, to protect hearing (29 *Code of Federal Regulations* 1910.95). Onsite noise levels will generally be in the 70 to 85 dBA range. Areas above 85 dBA will be posted as high noise level areas, and hearing protection will be required. The power plant will implement a hearing conservation program for applicable employees and will maintain exposure levels below 90 dBA.

5.7.6.2 State LORS

Cal/OSHA

The California Department of Industrial Relations, Division of Occupational Safety and Health enforces Cal/OSHA regulations, which are the same as the federal OSHA regulations described previously. The regulations are contained in Title 8, CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, Section 5095 et seq.

California Vehicle Code

Noise limits for highway vehicles are regulated under the California Vehicle Code, Sections 23130 and 23130.5. The limits are enforceable on highways by the California Highway Patrol and the County sheriffs' offices.

5.7.6.3 Local LORS

Alameda County – East County Area Plan

The Project area is located in a portion of unincorporated Alameda County covered by the East County Area Plan (2000). Noise is addressed in the Environmental Health and Safety Chapter and includes the following goals, policies, and implementation programs:

> ***Goal: To minimize East County residents' and workers' exposure to excessive noise.***
>
> ***Policy 288:*** *The County shall endeavor to maintain acceptable noise levels throughout East County.*
>
> ***Policy 289:*** *The County shall limit or appropriately mitigate new noise-sensitive development in areas exposed to projected noise levels exceeding 60 dB based on the California Office of Noise Control Land Use Compatibility Guidelines.*
>
> ***Policy 290:*** *The County shall require noise studies as part of development review for projects located in areas exposed to high noise levels and in areas adjacent to existing residential or other sensitive land uses. Where noise studies show that noise levels in areas of existing housing will exceed "normally acceptable" standards (as defined by the California Office of Noise Control Land Use Compatibility Guidelines), major development projects shall contribute their prorated share to the cost of noise mitigation measures such as those described in Program 104.*
>
> ***Implementation Program104:*** *The County shall require the use of noise reduction techniques (such as buffers, building design modifications, lot orientation, soundwalls, earth berms, landscaping, building setbacks, and real estate disclosure notices) to mitigate noise impacts generated by transportation-related and stationary sources as specified in the California Office of Noise Control Land Use Compatibility Guidelines.*

Alameda County Municipal Code

Chapter 6.60 of the Alameda County Code of Ordinances (2024) establishes the noise limits for Project. Exterior noise level standards are established in Section 6.60.040 as follows:

a. *It is unlawful for any person at any location within the unincorporated area of the county to create any noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the exterior noise level when measured at any single- or multiple-family residential, school, hospital, church, public library or commercial properties situated in either the incorporated or unincorporated area to exceed the noise level standards as set forth in Table 6.60.040A or Table 6.60.040B.*

Tables 6.60.040A and 6.60.040B are reproduced herein as Tables 5.7-12 and 5.7-13, respectively.

Table 5.7-12. Receiving Land Use — Single- or Multiple-Family Residential, School, Hospital, Church, or Public Library Properties Noise Level Standards, dBA

Category	Cumulative Number of Minutes in any 1-Hour Time Period	Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

Table 5.7-13. Receiving Land Use — Commercial Properties Noise Level Standards, dBA

Category	Cumulative Number of Minutes in any 1-Hour Time Period	Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
1	30	65	60
2	15	70	65
3	5	75	70
4	1	80	75
5	0	85	80

b. *In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal said ambient noise level.*

c. *For each of the noise level standards specified in Tables 6.60.040A and B shall be reduced by five dB(A) for simple tone noises, noises consisting primarily of speech or music for recurring impulsive noises.*

d. *If the intruding noise source is continuous and cannot reasonable be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured*

while the source is in operation shall be compared directly to the applicable noise level standards in Table 6.60.040A and Table 6.60.040B.

e. Notwithstanding the noise level standards set forth in this section, the noise level standard applicable to the emission of sound from transformers, regulators, or associated equipment in electrical substations shall be 60 dB(A).

An exception for construction noise is included in Section 6.60.070 of the County Code:

f. E. Construction. The provisions of this chapter shall not apply to noise sources associated with construction, provided said activities do not take place before seven a.m. or after seven p.m. on any day except Saturday or Sunday, or before eight a.m. or after five p.m. on Saturday or Sunday.

5.7.7 Agencies and Agency Contacts

No agencies were contacted directly to specifically discuss Project noise.

5.7.8 Permits and Permit Schedule

No permits are required; therefore, there is no permit schedule.

5.7.9 References

Alameda County. 2025. *Alameda County, California – Municipal Code.* https://library.municode.com/ca/alameda_county/codes/code_of_ordinances?nodeId=ALAMEDA_CO_CALIFORNIAMUCO.

Alameda County. 2000. *East County Area General Plan.* https://acgov.org/cda/planning/generalplans/documents/EastCountyAreaPlancombined.pdf.

American National Standards Institute (ANSI). 2013. Quantities and Procedures for Description and Measurement of Environmental Sound—Part 3: Short-term Measurements with an Observer Present. Standard S12.9-2013. Annex C. January. Prepared by Acoustical Society of America. Melville, NY.

Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. *Prediction of Noise from Power Plant Construction*. Bolt Beranek and Newman, Inc. Cambridge, MA. Prepared for the Empire State Electric Energy Research Corporation, Schenectady, NY.

Beranek, L.L. 1998. *Noise and Vibration Control.* Institute of Noise Control Engineering. McGraw Hill.

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment Manual.* FTA Report No. 0123. September.

International Organization for Standardization (ISO). 1993. ISO 9613-1, *Acoustics—Sound Attenuation During Propagation Outdoors*. Part 1: Calculation of the Absorption of Sound by the Atmosphere. Geneva, Switzerland.

International Organization for Standardization (ISO). 1996. ISO 9613-2, *Acoustics—Sound Attenuation During Propagation Outdoors*. Part 2: General Method of Calculation. Geneva, Switzerland.

Miller, L.N., E.W. Wood, R.M. Hoover, A.R. Thompson, S.L. Thompson, and S.L. Paterson. 1978. *Electric Power Plant Environmental Noise Guide*, Vol. 1. Bolt Beranek & Newman, Inc. Cambridge, MA. Prepared for the Edison Electric Institute, NY.

U.S. Environmental Protection Agency (EPA). 1971. *Noise from Construction Equipment and Operations, US Building Equipment, and Home Appliances*. Prepared by Bolt Beranek and Newman for EPA Office of Noise Abatement and Control. Washington, DC.

U.S. Environmental Protection Agency (EPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, EPA-550/9-74-004. March.

5.8 Paleontological Resources

Section 5.8 Paleontological Resources was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.9 Public Health

This section describes and evaluates the potential public health effects from construction and operation of Viracocha Battery Energy Storage System project (Viracocha BESS or Project). Section 5.9.1 provides an overview of the Project. Section 5.9.2 describes the affected environment. Section 5.9.3 presents the analysis of public health effects of construction and operation of the Viracocha BESS facility. Section 5.9.4 discusses potential other public health concerns associated with the Project, including hazardous materials and odors. Section 5.9.5 discusses potential cumulative health effects. Section 5.9.6 presents proposed mitigation measures to avoid or minimize any adverse impacts. Section 5.9.7 presents applicable laws, ordinances, regulations, and standards (LORS). Section 5.9.8 provides agency contacts. Section 5.9.9 presents permit requirements and schedules. Section 5.9.10 contains references cited or consulted in preparing this section. Appendix 5.9A contains supporting data for the public health analyses.

5.9.1 Project Overview as it Relates to Public Health

The Project consists of a proposed BESS facility in Alameda County, California. Figure 1-1 shows the Project regionally, and Figure 1-4 depicts the Project area, including the proposed gen-tie line to the nearby Ralph Substation. A complete description of the Project is presented in Section 2.

Air will be the dominant pathway for public exposure to chemical substances released by Project construction and operation. Airborne construction-related air toxic contaminants emissions will consist primarily of combustion by-products from onsite diesel-fired construction equipment and vehicles. Airborne operation-related emissions will consist primarily of combustion by-products from the one diesel emergency generator and one diesel water pump. Potential health risks from public exposure to combustion emissions from the Project construction were assessed through a detailed health risk assessment (HRA) modeling. Although exposure will occur almost entirely by direct inhalation, additional pathways were conservatively included in the HRA. The HRA was conducted in accordance with guidance established by the California Office of Environmental Health Hazard Assessment (OEHHA), the California Air Resources Board (CARB), and Bay Area Air District (BAAD). Details of the HRA discussion are in Section 5.9.3.

Discussion of the potential health risks associated with these substances, in addition to the potential health risks associated with all toxic air contaminants (TACs), is presented in this section. Emissions with established California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS), including nitrogen oxides, carbon monoxide, and fine particulate matter (PM_{10} and $PM_{2.5}$), are addressed in Section 5.1. Human health risks associated with the potential accidental release of stored hazardous materials, as applicable, are discussed in Section 5.5.

5.9.2 Affected Environment

The Project is in Alameda County, California, adjacent to the proposed Sand Hill Wind Repower project (to be constructed, owned, and operated by an affiliate of the Applicant) as shown on Figure 1-1. The Project includes a fenced BESS yard which will include a 362.8 megawatt-hour (MWh) BESS facility, improvements to an existing access road, Project substation and a new proposed gen-tie line. If expanding the existing Ralph Substation is not feasible, a new switching station or a line-tap located adjacent to the Ralph Substation would be included as part of the project.

The Project area is located approximately 0.8 mile south of the Bethany Reservoir, 1.8 miles north of Altamont Pass Road, and 4.7 miles northwest of the city limits of Tracy (Figure 1-4). The Project is expected to provide energy storage for California's electric markets, supporting the state's pursuit of an environmentally clean and reliable electrical system.

Sensitive receptors are defined as groups of individuals that may be more susceptible to health risks because of chemical exposure. Schools, both public and private; day care facilities; convalescent homes;

and hospitals are of particular concern. Sensitive receptors within a 6-mile buffer of the Project site are shown on Figure 5.5-1.

The Project site is surrounded by undeveloped open spaces without residents, workers, or other sensitive receptors located within 1,000 feet. There are only sparse worker and residential receptors within a 3-kilometer radius from the site. The offsite worker location that may have routine working activities is the Bethany Reservoir State Recreation Area to the north of the site, a landfill to the west of the site, and in an area approximately 7,000 feet to the east of the Project site. The nearest residential receptors are 9,700 feet southeast of the Project near Altamont Pass Road.

There are several communities within the BAAD's jurisdiction that have been identified under Assembly Bill (AB) 617's Community Health Protection Program, including East and West Oakland, Richmond, and southeast San Francisco. The Community Health Protection Program's goal is to reduce emissions of TACs and criteria air pollutants in communities affected by a high cumulative exposure burden. None of these identified communities are within a 6-mile radius of the Project. No other public health studies related to respiratory illnesses, cancers, or related diseases within a 6-mile radius of the Project site were identified in the last 5 years.

The BAAD initiated the Community Air Risk Evaluation program in 2004 to identify areas with high concentrations of air pollution and populations most vulnerable to air pollution's health impacts. The Community Air Risk Evaluation Program Retrospective & Path Forward (2004–2013) was released in 2014 (BAAQMD 2014). According to the report, the estimated incremental cancer risk because of TACs in the Bay Area decreased from 1,300 per million in 1990 to about 300 per million in 2012. Over 70% of the cancer risk related to air pollution in the Bay Area is because of diesel PM, and 90% of the total risk is because of three compounds: diesel PM, benzene, and 1,3-butadiene. All three of these compounds are emitted via fuel combustion.

5.9.3 Environmental Analysis

The analysis of potential environmental effects on public health from construction and operation of the Project is presented in the following sections.

5.9.3.1 Risk Types

Three different types of risk were typically evaluated in an HRA: cancer risk, non-cancer chronic risk, and non-cancer acute risk. Each of these risk types is described as follows.

Cancer Risk. Cancer risk is the probability or chance of contracting cancer over a human life span. Under various state and local regulations, an incremental cancer risk greater than 10 in one million because of a project is often considered to be a significant effect on public health. For example, the 10 in one million risk level is used by the Air Toxics Hot Spots (AB 2588) program and Proposition 65 as the public notification level for air toxic emissions from existing sources. When evaluating cancer risks from a single facility, it is important to note that the overall lifetime risk of developing cancer for the average male in the United States is approximately 412,900 per million, and about 421,400 per million for the average female (NIH 2025a). In California, from 2017 to 2021, the cancer incidence rates were 4,212 per million for males and 3,856 per million for females. The cancer death rates in California in the same period (2017 to 2021) were 1,558 per million for males, and 1,165 per million for females (NIH 2025b).

An incremental lifetime cancer risk of one in a million is typically used as a screening threshold of significance for potential exposure to carcinogenic substances in air. The incremental cancer risk level of one in one million, which has historically been judged to be an acceptable risk, originates from efforts by the Food and Drug Administration to use quantitative HRA for regulating carcinogens in food additives in light of the zero tolerance provision of the Delany Amendment (Hutt 1985). The associated dose, known as a "virtually safe dose," has become a standard used by many policy makers and the lay public for evaluating cancer risks. However, a study of regulatory actions pertaining to carcinogens found that an acceptable risk level can often be determined on a case-by-case basis. This analysis of 132 regulatory

decisions found that regulatory action was not taken to control estimated risks below one in a million, which are referred to as *de minimis* risks. *De minimis* risks are historically considered risks of no regulatory concern. Chemical exposures with risks above 4×10^{-3} (four in ten thousand), termed *de manifestis* risks, were consistently regulated. *De manifestis* risks are typically risks of regulatory concern. The risks falling between these two extremes were regulated in some cases, but not in others (Travis et al. 1987).

Since risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a highly conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans. In other words, the assumption is that humans are as sensitive as the most sensitive animal species. Therefore, the true risk is not likely to be higher than risks estimated using unit risk factors and is most likely lower, and could even be zero.

Non-Cancer Risk. Non-cancer health effects can be classified as either chronic or acute. In determining the potential health risks of non-cancerous air toxics, it is assumed there is a dose of the chemical of concern below which there would be no effect on human health. The air concentration corresponding to this dose is referred to as the Reference Exposure Level (REL). Non-cancer health risks are measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its REL. Hazard quotients for pollutants affecting the same target organ are typically summed with the resulting totals expressed as hazard indices for each organ system. A hazard index (HI) of less than 1.0 is considered to be an insignificant health risk.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. Chronic hazard quotients are derived from modeling annual TAC emissions.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the exposure duration is shorter. Because acute toxicity is manifested predominantly in the upper respiratory system at threshold exposures, all hazard quotients are typically summed to calculate the acute HI. One-hour average concentrations are divided by the acute RELs to obtain a hazard quotient for health effects caused by relatively high, short-term exposures to air toxics.

5.9.3.2 Significance Criteria

BAAD California Environmental Quality Act (CEQA) thresholds for local risks and hazards as published in the District's *California Environmental Quality Act Air Quality Guidelines* (BAAQMD 2022a) are presented in Table 5.9-1. Cancer and non-cancer risks from the Project were compared to the BAAD thresholds to determine whether the Project would have significant impacts on human health. If the risks are below the thresholds, the Project would have less than significant impacts.

Table 5.9-1. Local Risk and Hazard Significance Threshold Levels for BAAD

Category	Risk Threshold	Source
Construction and Operation	Incremental Cancer Risk > 10 in a million Acute/Chronic HI > 1 PM2.5 > 0.3 µg/m3 annual average	BAAD CEQA Air Quality Guidelines (BAAQMD 2022a)

µg/m^3 = microgram(s) per cubic meter

5.9.3.3 Toxic Air Contaminant Emissions

TAC emissions from the Project consist of a combination of toxic gases and toxic PM species. TAC emissions from the Project would be from the diesel emergency engine and the fire pump during Project operation, and from the diesel construction equipment and vehicles during Project construction. Because TAC emissions from the Project are dominantly from diesel combustion, diesel particulate matter (DPM) emissions were used as a surrogate to represent the TACs from the Project. Because DPM does not have approved acute RELs, the HRA evaluated the cancer and non-cancer chronic risks of the DPM emissions.

Project Operation

During Project operation, DPM emissions would be emitted from the diesel-fired emergency generator and the diesel-fired fire pump engine. The facility is unmanned and would need only one or two vehicle trips to the site per month for operation and maintenance (O&M). Therefore, vehicle emissions from O&M would cause negligible onsite DPM emissions on an annual basis. There are no other TAC emission sources related to the Project during its operation.

A summary of the DPM emissions from the emergency engine and the fire pump is in Table 5.9-2. Detailed emissions calculations are provided in Appendix 5.1A, per the methodology described in Section 5.1.

Table 5.9-2. Operational Diesel Particulate Matter Emissions Estimates

Pollutants	Fire Pump	Emergency Generator	Total
DPM (lb/year)	0.413	3.250	3.663

lb/year = pound(s) per year

Criteria pollutant emissions from Project operation are shown in Table 5.1-4 in Section 5.1. High concentrations of criteria pollutants in ambient air would also have health effects. Both the emergency generator and the fire pump would meet U.S. Environmental Protection Agency's (EPA's) most stringent Tier 4 emission standards for non-road engines. The Project operation would comply with applicable state and BAAD regulations, and the criteria pollutants emissions from the Project operation would be below the BAAD operational emission thresholds, as discussed in Section 5.1.6. Air quality analysis in Section 5.1.10 also demonstrated that the criteria pollutant emissions from the Project operation would comply with NAAQS and CAAQS. Because the NAAQS and CAAQS are intended to protect the general public with a wide margin of safety, the Project's criteria pollutant emissions are not anticipated to have a significant effect on public health. More detailed analysis for criteria pollutant health impacts is not necessary, thus, it is not discussed further in this section.

Project Construction

The construction phase of the Project is expected to take approximately 14 months for the initial construction and additional 7 months at the end of the Project lifespan for facility decommissioning and demolition. During Project construction, strict construction practices that incorporate safety and compliance with applicable LORS will be followed (Section 5.9.7). In addition, emission control measures to minimize and reduce criteria pollutant emissions from construction activities will be implemented, as described in Section 5.1.6.

The primary air toxic pollutant of concern associated with construction activities is DPM generated from onsite diesel-fueled construction equipment and vehicles. Because cancer risks were evaluated based on a 30-year exposure duration and the construction would last less than 2 years, the total DPM exhaust emissions from construction activities were averaged over the 30-year exposure duration in the HRA. A

summary of the DPM emission rates is presented in Table 5.9-3.[1] Details of the DPM construction emissions are provided in Appendix 5.9-A.

Table 5.9-3. Construction Toxic Air Contaminant Emissions Estimates

Pollutant	Total Construction Emissions (lb/Project)	Annualized Emissions (lb/year) [a]
DPM	173.179	5.773

[a] Annualized emissions were calculated by averaging the total construction emissions over a 30-year period.

5.9.3.4 Air Toxics Exposure Assessment Methodology

Project Operation

AERMOD Modeling

Ground-level concentrations of DPM associated with the Project operation emissions were estimated using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) dispersion modeling program using the same modeling methodology as discussed in Section 5.1.9, except the receptor grid setting is discussed as follows.

The selection of receptors in AERMOD for the HRA was as follows:

- Fenceline receptors with 20-meter (m) spacing around the facility fence line
- 20-m spacing from the fence line to 325 m from the fence line
- Discrete receptor locations for residential receptors and worker receptors within approximately 3 kilometers from the fence line
- Census receptors within 3 kilometers from the fence line

All receptors and source locations were expressed in the Universal Transverse Mercator North American Datum 1983, Zone 10 coordinate system. U.S. Geological Survey National Elevation Dataset terrain data were used in conjunction with the AERMAP terrain preprocessor (Version 24142) to determine receptor elevations and terrain maxima.

Figure 5.9-1 displays the facility fence line and receptor grids used in the HRA modeling assessment. The meteorological station and windrose showing the wind pattern in the Project area are shown on Figure 5.1-2 and Figure 5.1-3, respectively.

Health Risk Assessment

The HRA analysis was conducted following the OEHHA *Air Toxics Hot Spots Program Risk Assessment Guidelines* (OEHHA 2015), BAAQMD's *Health Risk Assessment Modeling Protocol* (BAAQMD 2020), and BAAQMD's CEQA Air Quality Guidance (BAAQMD 2022a). AERMOD modeling results were imported into the CARB's Hotspots Analysis and Reporting Program (HARP) Air Dispersion Modeling and Risk Tool program (HARP 2, dated 22118, released on April 28, 2022, CARB 2022) to estimate the cancer and non-cancer chronic risks from the DPM emissions. HARP program incorporates the latest CARB and OEHHA approved risk assessment health values such as the cancer potency values and RELs used for cancer and non-cancer risk analysis.

[1] Note that hourly emissions estimates were not required because there is no short-term health risk associated with exposure to DPM.

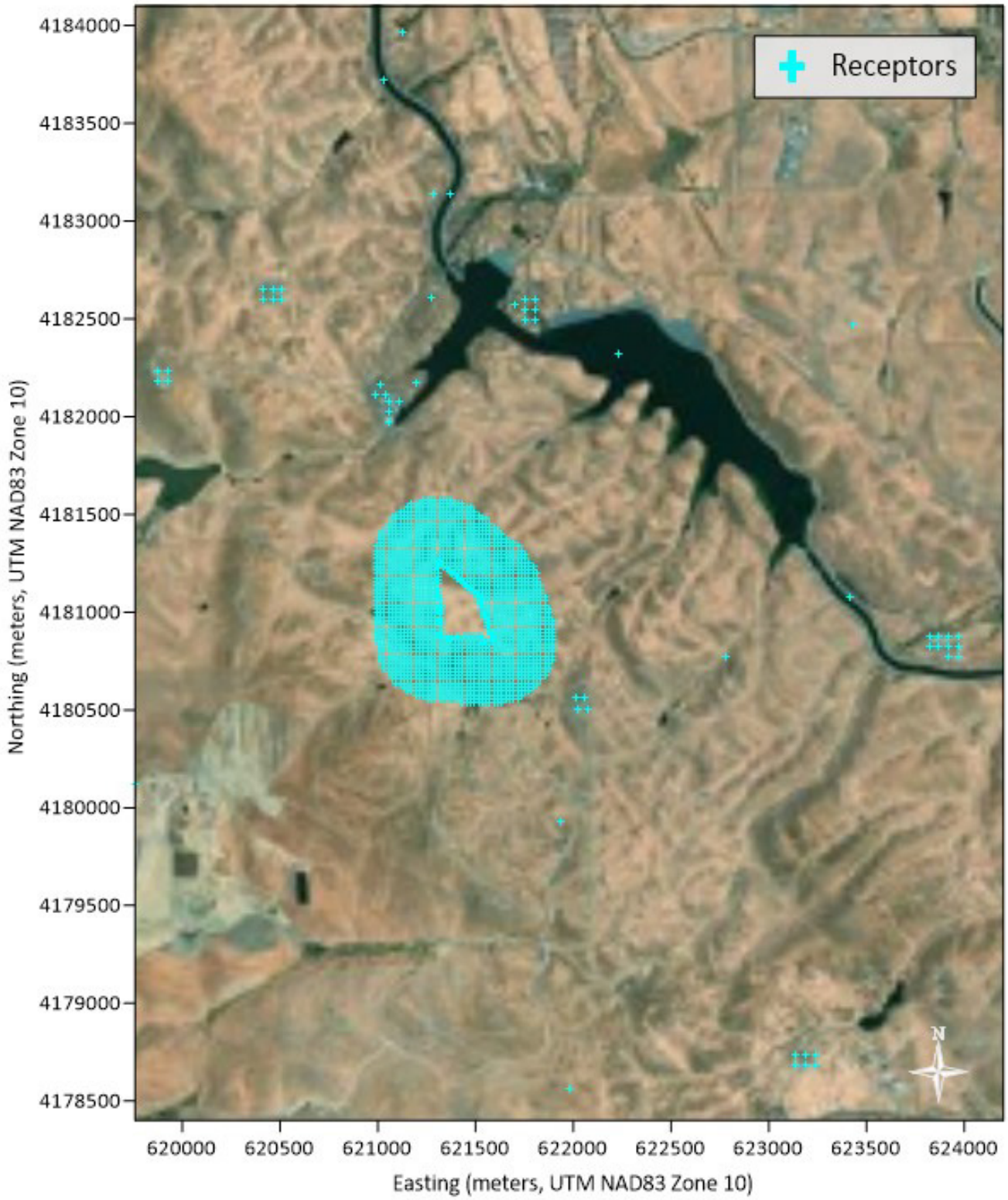


Figure 5.9-1
HRA Modeling Receptor Grids – Project Construction
Viracocha BESS Project
Alameda County, California

Jacobs

Health Risk Characterization

Health risks potentially associated with carcinogenic air pollutants from the Project, the DPM, were calculated as incremental lifetime cancer risks. The incremental lifetime cancer risk for a pollutant is estimated based on the concentration DPM at ground level, breathing rates of the exposed person, inhalation cancer potency, oral slope factor, frequency and duration of exposure at the receptor, and age sensitivity factor.

Evaluation of potential non-cancer health risks from long-term exposure to DPM emissions was performed by comparing modeled ground-level DPM concentrations with the DPM REL. An REL is a concentration in the air at or below which no adverse health effects are anticipated. Potential non-cancer chronic effects were evaluated by calculating a ratio of the modeled concentration in the air and the REL to develop the hazard quotient.

Health Risk Modeling Software and Options

Risk characterization from DPM emitted by the diesel emergency generator and the fire pump was carried out according to the procedures specified by OEHHA guidance for both carcinogenic and non-carcinogenic risks (OEHHA 2015), as summarized previously. As recommended by the 2015 OEHHA guidance, a Tier 1 assessment was performed. The Tier 1 assessment is the most conservative of the four tier assessment methodologies identified in the OEHHA guidance and uses a standard point-estimate approach with standard OEHHA assumptions.

Residential and sensitive receptor cancer risks were evaluated using the 30-year continuous exposure duration scenario and worker cancer risk was evaluated using the 25-year exposure duration (8 hours per day starting at age 16 years old), as recommended in the OEHHA guidance (OEHHA 2015). Based on the OEHHA guidance, the Risk Management Plan (RMP) with OEHHA Derived Method in HARP 2 was used for the residential cancer risk evaluation, following the BAAD HRA Modeling Protocol (BAAQMD 2020). The RMP Derived Method uses a breathing rate of the 95th percentile for age groups less than 2 years old and the 80th percentile for age groups that are greater than or equal to 2 years old if inhalation is one of the driven pathways, otherwise, the inhalation pathway uses the 65th percentile breathing rate. For worker cancer risks, the OEHHA derived method in the HARP 2 program was used. The OEHHA derived method uses the high-end point estimate (that is, 95th percentile) for the two driving (dominant) exposure pathways (for example, soil and breast milk) and the mean (65th percentile) point estimate for the remaining pathways.

The HRA modeling method and the exposure pathways included for each risk scenario were selected following the OEHHA and BAAD guidance and are summarized in Table 5.9-4.

Table 5.9-4 Summary of HARP 2 Exposure Pathways

Risk Analysis	Model Exposure Pathways	Intake Rate Percentile Approach
Cancer	Inhalation Soil Ingestion Dermal Absorption Mother's Milk	Residents: RMP using the Derived Method Worker: OEHHA Derived Method
Non-Cancer Chronic	Inhalation Soil Ingestion Dermal Absorption Mother's Milk Homegrown Produce	OEHHA Derived Method

Health Risk Impact Locations

Health risks were evaluated for each of the receptors included in the HRA analysis. Health risks at the point of maximum impact (PMI), for the maximally exposed individual resident (MEIR), and for the maximally exposed individual worker (MEIW) were compared with the BAAD thresholds.

The PMI is the receptor location where the highest concentrations of air pollutants associated with the Project emissions are predicted to occur, based on the air dispersion modeling. This location was assumed to be equivalent to a residential receptor exposed for the maximum Project lifetime of 30 years. Human health risks associated with emissions from the Project would not be higher at any other location than at the location of the PMI. If there is no significant effect associated with concentrations in air at the PMI location, it is unlikely that there would be significant effects in any location in the vicinity of the Project.

The MEIR corresponds to the location of a residence or other non-residential sensitive receptor that has the highest health risk impact. Because there are no non-residential sensitive receptors in the Project area, the MEIR in this HRA is the maximally impacted residential receptor.

Health risks for the MEIW refer to an offsite worker location with the highest impacts. The worker locations used in this HRA are defined as the locations that would be routinely staffed with offsite workers performing daily activities. Several substations near the Project area were excluded from the cancer and non-cancer chronic risks because these substations are not staffed.

Cancer Burden

Cancer burden can be calculated by multiplying the cancer risk at a census block centroid by the number of people who live in the census block and summing the cancer cases across the zone of impact. A census block is defined as the smallest entity for which the Census Bureau collects and tabulates decennial census information; it is bounded on all sides by visible and non-visible features shown on Census Bureau maps. A centroid is defined as the central location within a specified geographic area.

Cancer burden is an estimate of the number of potential cancer cases within the population that were exposed to the emissions for a lifetime. For example, if 10,000 people are exposed to a carcinogen at a concentration with a 1×10^{-5} cancer risk for a lifetime, the cancer burden is 0.1, and if 100,000 people are exposed to a 1×10^{-5} risk, the cancer burden is 1.0.

Project Construction

Although construction-related emissions are considered temporary and localized, resulting in no long-term effects on the public, an HRA was conducted to estimate potential health risks associated with public exposure to DPM during the Project construction. Cancer risks and non-cancer chronic risks from construction emissions were evaluated for the PMI, MEIR, and MEIW using the same AERMOD and HRA methodologies as described in Section 5.9.3.4, except the emission source parameters as discussed as follows.

Construction Emission Sources Parameters

The HRA for the construction activities evaluated the health risks from DPM emitted from onsite construction equipment and vehicles. Parameters of construction emission sources used in AERMOD are presented in Table 5.9-5. The source parameters were developed following the BAAQMD *CEQA Air Quality Guidelines Appendix E: Recommended Methods For Screening and Modeling Local Risks and Hazards* (BAAQMD 2022b). Volume sources are used to represent the onsite off-road equipment and vehicles. The analysis used an 8-meter width for adjacent volume sources to characterize vehicle movements. The volume sources were spread out evenly throughout the entire construction site.

Table 5.9-5. Volume Source Parameters for Construction Equipment and Vehicles

Volume Source Type	Base Elevation (m)	Release Height (m)	Initial Horizontal Dimension (m)	Initial Vert Dimension (m)
Non-Trucks	130.09	1.3	3.72	1.21
Trucks	130.09	3.4	3.72	3.16

5.9.3.5 Air Toxic Exposure Assessment Results

Project Operation

Estimates of the incremental lifetime cancer risk and non-cancer HIs associated with operational-related concentrations in air for the PMI, MEIR, MEIW are presented in Table 5.9-6 for comparison to the BAAD's CEQA significance thresholds. The locations associated with these impacts are shown on Figure 5.9-2.

As shown, predicted Project operation impacts are much lower than the cancer risk threshold of 10 in one million at the PMI for the MEIR and the MEIW. The chronic risk impacts are negligible and below the HI threshold of 1.0 at the PMI for the MEIR and the MEIW. Therefore, the health risks associated with Project operation are less than significant. Acute risks were not included in the analysis because DPM has only approved risk values for long-term cancer and chronic risks.

Table 5.9-6. Project Operation HRA Summary

Receptor Type	Receptor Number	UTM E (m)	UTM N (m)	Cancer Risk (per million)	Chronic HI	Acute HI
PMI	761	621,215.00	4,180,875.00	0.424	0.000114	N/A
MEIR	41	623,239.18	4,178,735.98	0.00424	0.0000011	N/A
MEIW	33	623,820.71	4,180,823.10	0.000881	0.0000028	N/A

E = Easting

N = Northing

N/A = not applicable. DPM does not have approved acute risk values.

UTM = Universal Transverse Mercator

$PM_{2.5}$ Concentrations from Operation

In addition to the cancer and non-cancer HI thresholds, BAAD uses 0.3 µg/m^3 as the $PM_{2.5}$ significant threshold for hazardous risks from Project operation emissions. AERMOD modeling was conducted for the $PM_{2.5}$ emissions from the Project operation, as described in Section 5.1.10. The modeling results indicate that the annual average $PM_{2.5}$ concentration at the PMI location would be 0.05 µg/m^3 during Project operation, much lower than the 0.3 µg/m^3 threshold. All other locations within the modeling area would have lower concentrations than at the PMI. Therefore, the Project construction emissions of $PM_{2.5}$ are not expected to cause significant health impacts.

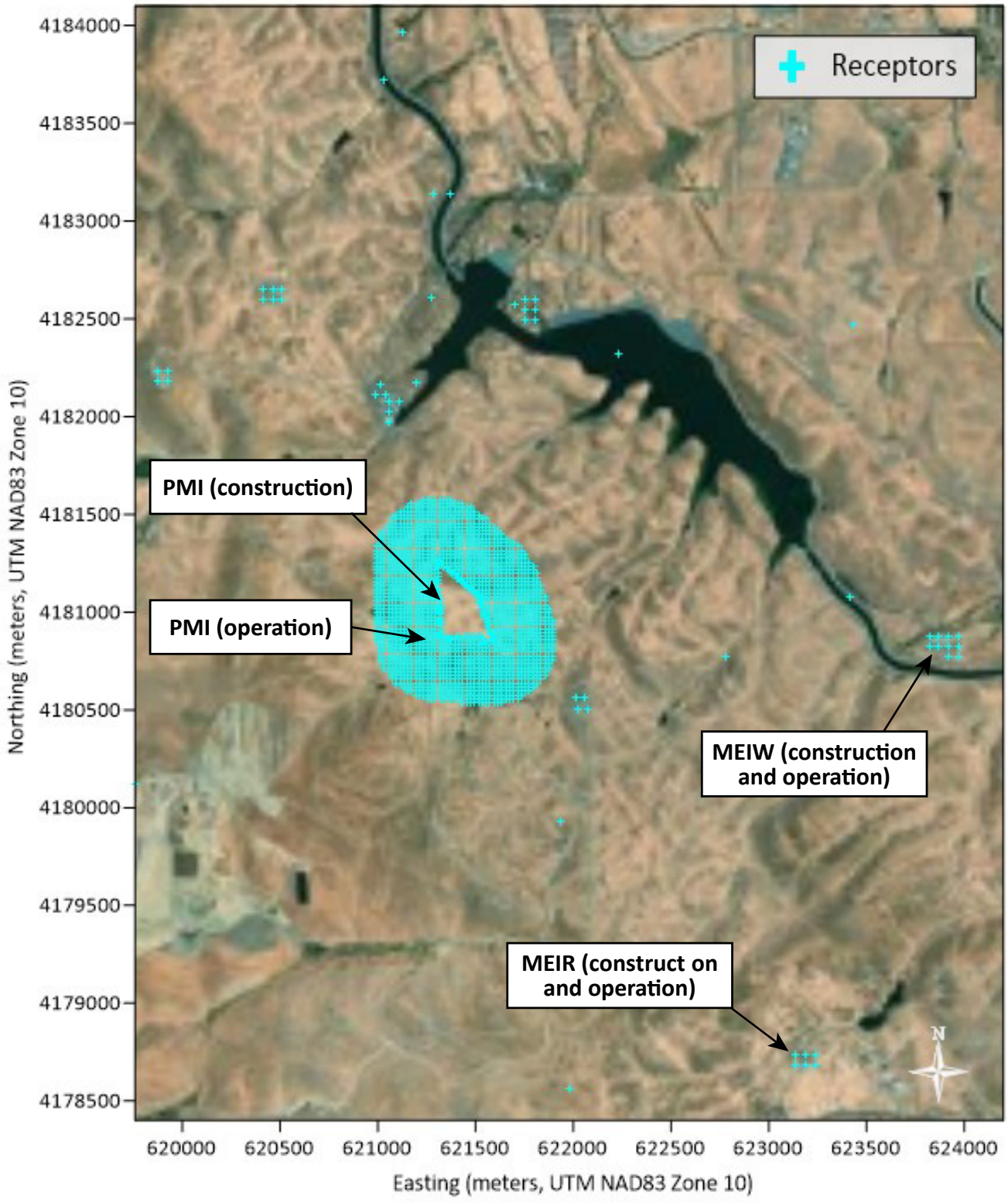


Figure 5.9-2
HRA Modeling Results – PMI, MEIR, and MEIW Locations
Viracocha BESS Project
Alameda County, California

Jacobs

Summary

As described previously, human health risks associated with operational emissions from the Project would be below the BAAD thresholds for cancer and non-cancer chronic risks. In addition, $PM_{2.5}$ concentration would be below the BAAD local risk and hazard threshold. Cancer burden from the Project would be zero because there are no receptors exposed to cancer risks over 1 in a million during Project operation. Therefore, the cancer burden is less than the BAAD's significance threshold value of 0.5 per BAAD Regulation 2 Rule 5 for new source review of TACs. The Project operation would not cause significant impacts on health risks.

Detailed risk and hazard values provided in the HARP input and output files are provided electronically with the application.

Project Construction

Estimates of the facility-wide incremental lifetime cancer risk and chronic HI associated with construction-related concentrations in air for the PMI, MEIR, and MEIW are presented in Table 5.9-7, with locations presented on Figure 5.9-2. Cancer risks are below the BAAD's CEQA significance thresholds of 10 in one million at PMI, MEIR, and MEIW. Non-cancer chronic risks are below the threshold of 1. Acute risks were not included in the analysis because DPM only have approved risk values for long-term cancer and chronic risks. Therefore, predicted impacts associated with the construction activities are less than significant.

Table 5.9-7. Construction HRA Summary – Project

Receptor Type	Receptor Number	UTM E (m)	UTM N (m)	Cancer Risk (per million)	Chronic HI	Acute HI
PMI	1037	621,315.00	4,181,035.00	8.72	0.0023	N/A [a]
MEIR	41	623,239.18	4,178,735.98	0.019	0.000005	N/A [a]
MEIW	33	623,820.71	4,180,823.10	0.003	0.0000098	N/A [a]

[a] DPM does not have approved acute risk values.

A cancer burden analysis was not performed for the construction phase of the Project. There are no population living within the area that has cancer risks over 1 in a million. In addition, there are no applicable thresholds in BAAD's CEQA guidance or the BAAD rules for a cancer burden from construction emissions.

Detailed air modeling HRA input and output files for construction emissions are submitted electronically with this application.

$PM_{2.5}$ Concentrations from Construction

BAAD CEQA air quality guidance (BAAQMD 2022a) uses an annual average concentration of 0.3 µg/m^3 as the $PM_{2.5}$ significant threshold for hazardous risks from construction emissions. The guidance recommends comparing the annual average $PM_{2.5}$ concentrations for every year of construction to the threshold of significance.

$PM_{2.5}$ concentrations during Project construction were estimated based on the emissions from equipment and vehicle exhaust, as well as fugitive dust emissions and vehicle tire wear and brake wear. A summary of the concentrations for each year of the construction are in Table 5.9-8. $PM_{2.5}$ concentrations would be below the 0.3 µg/m^3 threshold at the MEIR and MEIW for all construction years. The MEIR and MEIW concentrations represent the maximum level of impact within the study area where a resident or worker could potentially be exposed. All other worker and residential locations would have lower $PM_{2.5}$ concentrations. Because the $PM_{2.5}$ concentrations would be below the BAAD threshold, the Project would have less than significant impacts.

Table 5.9-8. Average Annual $PM_{2.5}$ Concentration During Project Construction

Construction Year	$PM_{2.5}$ Emissions (lb/year)	Project $PM_{2.5}$ Concentration for MEIR ($\mu g/m^3$)	Project $PM_{2.5}$ Concentration for MEIW ($\mu g/m^3$)
2026	10,402	0.045	0.088
2027	7,913	0.035	0.067
2056	7,377	0.032	0.062

Note:

$PM_{2.5}$ concentrations during construction were scaled from the DPM ground-level concentrations during construction.

5.9.4 Other Public Health Concerns

Hazardous Materials

Hazardous materials may be used and stored at the Project site. The hazardous materials stored in significant quantities onsite and descriptions of their uses are presented in Section 5.5. Use of chemicals at the Project site will be in accordance with standard practices for storage and management of hazardous materials. Normal use of hazardous materials, therefore, will not pose significant risk to public health. While mitigation measures will be in place to prevent releases, accidental releases that migrate offsite could result in potential effects on the public.

The California Accidental Release Prevention (CalARP) Program regulations and *Code of Federal Regulations* (CFR), Title 40, Part 68 under the Clean Air Act (CAA) establish emergency response planning requirements for acutely hazardous materials. These regulations require the preparation of an RMP, which is a comprehensive program for identifying hazards and predicting the areas that may be affected by a release of a program-listed hazardous material. The Project will not be subject to these regulations because it is not expected to use any RMP-listed materials in quantities above the applicability thresholds.

Operational Odors

There are no emissions from the BESS equipment. The Project would have one diesel emergency generator and one fire pump engine that would be used only during routine maintenance and testing, and during emergencies. The Project operation will not result in odorous emissions.

Electromagnetic Field Exposure

Electromagnetic fields (EMFs) occur independently of one another as electric and magnetic fields at the 60-hertz frequency used in gen-tie lines, and both are created by electric charges. Electric fields exist when these charges are not moving. Magnetic fields are created when the electric charges are moving. The magnitude of both electric and magnetic fields falls off rapidly as the distance from the source increases (proportional to the inverse of the square of distance).

There are no sensitive receptors near the gen-tie between the BESS facility and the substation. Because the electric transmission lines do not typically travel through residential areas and based on findings of the National Institute of Environmental Health Sciences (NIEHS) (1999), EMF exposures are not expected to result in a significant effect on public health. The NIEHS report to the U.S. Congress found that "the probability that ELF [extremely low frequency]-EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal scientific support that exposure to this agent is causing any degree of harm" (NIEHS 1999).

Additional details regarding EMFs are included in Section 3.5.

5.9.5 Cumulative Effects

The operational HRA indicates that the maximum cancer risk because of exposure to air toxics emitted by the Project operations will be below the BAAD's significance threshold of 10 in one million at PMI, MEIR, and MEIW locations. The cancer risk at the PMI is 0.392 in a million, which represents the maximum possible cancer risk outside of the facility boundary. Cancer incidents are much lower in locations where long-term exposure is more likely to occur, such as at the locations of the MEIR (0.00392 in a million) and MEIW (0.000799 in a million). Non-cancer chronic effects (that is, HI values) from Project operations are also below the BAAD significance thresholds of 1.0 at all receptor locations. There are no other emission sources that would have emissions high enough to cumulatively affect the Project areas. Therefore, the potential cumulative health risk impacts from Project operation are expected to be less than significant.

The construction HRA indicates that the maximum cancer risk because of exposure to air toxics emitted by the Project construction will be approximately 8.72 in one million at the PMI, which is below the BAAD's cancer risk threshold of 10 in one million. Cancer risks are expected to be much less in locations where long-term exposure is more likely to occur, such as at the locations of the MEIR (0.019 in a million) and MEIW (0.030 in a million). Non-cancer chronic effects (that is, HI values) from Project construction are also well below the BAAD significance thresholds of 1.0 at all locations. Additionally, the Project construction activities will be temporary, and best management practices will be used throughout the construction period to minimize pollutant emissions. Therefore, the potential cumulative health risk impacts from construction are also expected to be less than significant.

Based on modeling studies conducted by California Energy Commission staff for other projects, an analysis of a project's cumulative impacts is typically only required if the proposed facility is generally within less than 0.5 mile of another existing, major, or large toxics emissions source. There are no existing, major, or large toxics emissions sources within 0.5 mile of the Project. Therefore, a cumulative impacts analysis for potential health risks is not required.

5.9.6 Mitigation Measures

5.9.6.1 Project Operation

The potential health risk impacts presented in Section 5.9.3.5 indicate that the Project will not have a significant impact when compared to the BAAD's significance thresholds. As a result, additional mitigation measures are not required for the air toxic emissions from operation of the Project. Nonetheless, the diesel-fired emergency generator and the fire pump will meet Tier 4 emission standards, respectively. DPM emissions would be minimized to reduce exposure by nearby receptors.

5.9.6.2 Project Construction

The construction activities of the Project would be finite construction impacts that would be reduced with the implementation of the additional construction mitigation measures presented in Section 5.1.

The potential health risk impacts presented in Section 5.9.3.5 indicate that the Project will not have a significant impact when compared to the BAAD's significance thresholds. As a result, additional mitigation measures are not required for the air toxic emissions from construction of the Project.

5.9.7 Laws, Ordinances, Regulations, and Standards

The relevant LORS that affect public health and are applicable to the Project are identified in Table 5.9-9, along with the conformity of the Project to each of the listed LORS. Table 5.9-9 also summarizes the agencies responsible for regulating public health under each of the applicable LORS.

Table 5.9-9. Summary of LORS – Public Health

LORS	Purpose	Regulating Agency	Project Conformance
CAA Title III	Establishes a plan for achieving significant reductions in emissions of hazardous air pollutants from major sources.	EPA Region 9 CARB BAAD	Based on the HRA results presented in Section 5.9.3.5, the Project's cancer, chronic, and acute health risks do not exceed acceptable levels. Emissions of criteria pollutants will be minimized by applying the Best Available Control Technology to the Project, where feasible. Facility will comply with applicable federal, state, and BAAD rules and regulations.
40 CFR Part 68 (RMP), 19 CCR Sections 2735.1 to 2785.1 (CalARP Program), and California Health and Safety Code (CHSC) Sections 25531 to 25541	Prevents or minimizes accidental releases of acutely hazardous substances that can cause serious harm to the public and the environment.	EPA Region 9 Department of Toxic Substances Control (DTSC) Imperial Certified Unified Program Agency (CUPA)	A vulnerability analysis will be performed to assess potential risks from a spill or rupture from any affected storage tank, if required. An RMP is not expected to be required.
CHSC Section 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986– Proposition 65)	Provides notification of Proposition 65 chemicals.	OEHHA	The facility will determine Proposition 65 status and comply with all signage and notification requirements, as applicable. Sections 5.5 and 5.15 provide additional discussion regarding hazardous materials and water quality, respectively.
CHSC Sections 25500 to 25510	Establishes requirements for developing business and area plans relating to the handling and release of hazardous materials.	State Office of Emergency Services DTSC Imperial CUPA	An HMBP, including a hazardous materials inventory and emergency response plan, will be prepared for distribution to affected agencies, as required. Additionally, releases of hazardous materials will be immediately reported to affected agencies, as required. Section 5.5 provides additional discussion regarding hazardous materials.

LORS	Purpose	Regulating Agency	Project Conformance
CHSC Section 44300 to 44384 (Air Toxics "Hot Spots" Information and Assessment Act—Assembly Bill 2588)	AB 2588 requires the development of a statewide inventory of TAC emissions from stationary sources. The program requires affected facilities to (1) prepare an emissions inventory plan that identifies relevant TACs and sources of TAC emissions; (2) prepare an emissions inventory report quantifying TAC emissions; and (3) prepare an HRA, if necessary, to quantify the health risks to the exposed public. Facilities with significant health risks must notify the exposed population, and in some instances must implement RMPs to reduce the associated health risks (CARB 2025).	CARB OEHHA BAAD	The Project will participate in the AB 2588 inventory and reporting program, if required. Based on the HRA results presented in Section 5.9.3.5, cancer, chronic, and acute health risks do not exceed acceptable levels.
40 CFR Part 63	Establishes National Emission Standards for Hazardous Air Pollutants (NESHAP). [a]	EPA Region 9 BAAD	The Project will comply with applicable NESHAP, for emissions from engines.
BAAD Regulation 2 Rule 5	Requires preconstruction review of air toxics for new or modified stationary sources.	BAAD	An Authority to Construct and Permit to Operate will be obtained from BAAD before construction and operation of the Project, respectively. As a result, the Project will comply with the BAAD's permitting requirements for air toxics.

[a] These are standards for air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established.

HMBP = Hazardous Materials Business Plan

5.9.8 Agency Jurisdiction and Contacts

Table 5.9-10 presents the contact information for each agency contacted during the development of this Project. These agencies may have jurisdiction over Project public health issues and permitting.

Table 5.9-10. Agency Contacts for Public Health

Public Health Concern	Agency	Contact
Public exposure to air pollutants	California Energy Commission	Wenjun Qian, Ph.D., P.E. Air Resources Engineer California Energy Commission 715 P St, MS-46 Sacramento, CA 95814 Email: Wenjun.Qian@energy.ca.gov Phone: 916-477-1339
	BAAD	Xuna Cai Senior Air Quality Engineer Bay Area Air Quality Management District 375 Beale Street Suite 600 San Francisco, CA 94105 Phone: 415-749-4788 xcai@baaqmd.gov

5.9.9 Permit Requirements and Schedules

Agency-required permits or plans related to public health may include an HMBP and a BAAD-issued Authority to Construct/Permit to Operate. These requirements are discussed in detail in Sections 5.5 and 5.1, respectively.

5.9.10 References

Bay Area Air Quality Management District (BAAQMD). 2014. *Improving Air Quality & Health in Bay Area Communities*. April. https://www.baaqmd.gov/~/media/files/planning-and-research/care-program/documents/care_retrospective_april2014.pdf.

Bay Area Air Quality Management District (BAAQMD). 2020. BAAQMD Health Risk Assessment Modeling Protocol. https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en.

Bay Area Air Quality Management District (BAAQMD). 2022a. *2022 California Environmental Quality Act (CEQA) Air Quality Guidelines. 3 Thresholds of Significance.* https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-3-thresholds_final_v2-pdf.pdf?rev=a976830cce0c4a6bb624b020f72d25b3&sc_lang=en.

Bay Area Air Quality Management District (BAAQMD). 2022b. *Air Quality Guidelines Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards*. https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-e-recommended-methods-for-screening-and-modeling-local-risks-and-hazards_final-pdf.pdf?la=en.

California Air Resources Board (CARB). 2015. *Risk Management Guidance for Stationary Sources of Air Toxics.* California Air Pollution Control Officers Association. July 23. https://ww2.arb.ca.gov/sites/default/files/classic/toxics/rma/rmgssat.pdf.

California Air Resources Board (CARB). 2022. "HARP Air Dispersion Modeling and Risk Tool." Dated 22118 – Released April 28, 2022. https://ww2.arb.ca.gov/resources/documents/harp-air-dispersion-modeling-and-risk-tool?keywords=2025.

California Air Resources Board (CARB). 2025. "AB 2588 District Prioritization Scores and Risk Threshold Levels." https://ww2.arb.ca.gov/ab-2588-district-prioritization-scores-and-risk-threshold-levels.

Hutt, P.B. 1985. *Use of Quantitative Risk Assessment in Regulatory Decision Making Under Federal Health and Safety Statutes*. Risk Quantitation and Regulatory Policy. Eds. D.G. Hoel, R.A. Merrill, and F.P. Perera. Banbury Report 19, Cold Springs Harbor Laboratory.

National Institute of Environmental Health Sciences (NIEHS). 1999. *NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*. Prepared in Response to the 1992 Energy Policy Act (PL 102-486, Section 2118). NIH Publication No. 99-4493. May 4. https://www.niehs.nih.gov/sites/default/files/health/assets/docs_p_z/report_powerline_electric_mg_predates_508.pdf.

National Institutes of Health National Cancer Institute (NIH). 2025a. "SEER 22 Incidence and Mortality, 2000–2021 (2020 Excluded). https://canques.seer.cancer.gov/cq_results.php?dir=devcan2021&db=1&rpt=TAB&sel=1^7^1^2,3^59,57^0^19&z=Site^59,57^Sex^2,3&dec=2&template=null.

National Institutes of Health National Cancer Institute (NIH). 2025b. "State Cancer Profiles. Quick Profiles: California." https://statecancerprofiles.cancer.gov/quick-profiles/index.php?tabSelected=3&statename=unitedstates#t=2.

Office of Environmental Health Hazard Assessment (OEHHA). 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines*. Guidance Manual for Preparation of Health Risk Assessments. February. https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.

Travis, C.C., E.A.C. Crouch, R. Wilson, and E.D. Klema. 1987. "Cancer Risk Management: A Review of 132 Federal Regulatory Cases." *Environ. Sci. Technol.* Vol. 21, Issue 5. pp. 415–420.

5.10 Socioeconomics

This section discusses the environmental setting, consequences, regional and local impacts, and mitigation measures associated with the socioeconomic aspects of the Viracocha Hill Battery Energy Storage System Project (Viracocha Hill BESS or Project). Section 5.10.1 describes the socioeconomic environment that might be affected by the Project. Section 5.10.2 provides an environmental analysis of the construction and operation of the proposed development. Section 5.10.3 discusses whether there will be any cumulative effects from the Project. Section 5.10.4 describes mitigation measures that will be implemented to avoid impacts. Section 5.10.5 discusses the applicable laws, ordinances, regulations, and standards (LORS). Section 5.10.6 lists the agencies involved and agency contacts. Section 5.10.7 discusses permits and permit schedules. Section 5.10.8 lists reference materials used in preparing this section. A screening-level environmental justice analysis is provided in Appendix 5.10A.

5.10.1 Affected Environment

The Project is located in eastern Alameda County within the Altamont Pass Wind Resource Area (APWRA). It is located in a region of Alameda County characterized mostly by grazing and wind power production, with more recent additions of proposed BESS facilities. The area surrounding the Viracocha Hill BESS site is primarily grazing land.

The Project is located approximately 0.8 mile south of the Bethany Reservoir, 1.8 miles north of Altamont Pass Road, and 4.7 miles northwest of the city limits of Tracy, California. The Project is expected to provide 362.8-MW-hr and will consist of a 17-acre area that will include an approximately 14-acre BESS yard, laydown area, substation, and retention pond. The Project includes improvements to an existing 0.3-mile-long access road, a 0.15-acre road improvement, and an approximately 1,325-foot-long gen-tie line connecting to the Ralph Substation. If expanding the Ralph Substation is unavailable, a new switching station or a line-tap will be developed adjacent to the existing substation.

Because the Project will be located in unincorporated Alameda County, California, the region of influence for purposes of evaluating the socioeconomic impacts associated with the Project will be Alameda County.

5.10.1.1 Population

Alameda County is located within the densely populated San Francisco Bay Area. It is bordered by San Joaquin County to the east, Contra Costa County to the north, San Francisco County to the west, Santa Clara County to the south, and Stanislaus County to the southeast.

As of January 1, 2024, Alameda County had an estimated population of 1,641,869 and is ranked 7th out of the 58 counties in California in terms of population (DOF 2024a). Alameda County was formed in 1853 from territory of two counties created in 1850: Contra Costa and Santa Clara (Alameda County 2024a). With an area of 737.5 square miles, it is the 50th largest county in California (US Census Bureau 2024a).

Alameda County is a highly urbanized county with about 90% of its population living in one of 14 incorporated cities. The largest of these cities, based on the January 1, 2024 population estimates, are: Oakland (population 425,093), Fremont (population 229,250), and Berkeley (population 125,327). However, the closest city to the Project is Tracy in San Joaquin County. The Tracy had an estimated January 1, 2024 population of 96,609 (DOF 2024a).

Historical population data for Alameda County and California are summarized in Table 5.10-1. Annual average compounded population growth rates, based on this historical population data, are summarized in Table 5.10-2. During the 2000s, the population of Alameda County increased at an average annual rate of about 0.5%, lower than that of California. The average annual growth rate for the 10 years from 2010 to 2020 was 1.1% for Alameda County and 0.6% for California. Between 2020 and 2024, Alameda County California experienced declining population growth: -0.6% for Alameda and -0.3% for the state.

Table 5.10-1. Historical and Projected Populations

Area	2000	2010	2020	2024	2030 (projected)	2040 (projected)	2050 (projected)
Alameda County	1,443,939	1,510,271	1,682,353	1,641,869	1,689,225	1,772,209	1,840,221
California	33,873,086	37,253,956	39,538,223	39,128,162	39,694,960	40,914,063	41,655,829

Sources: DOF 2024b; DOF 2024c; DOF 2024d

Table 5.10-2. Historical and Projected Annual Average Compounded Population Growth Rate

Area	2000-2010 (percent)	2010-2020 (percent)	2020-2024 (percent)	2024-2030 (percent)	2030-2040 (percent)	2040-2050 (percent)
Alameda County	0.45	1.08	-0.61	0.48	0.48	0.38
California	0.96	0.60	-0.26	0.24	0.30	0.18

Tables 5.10A-1 and 5.10A-2, provided in Appendix 5.10A, identify the minority and low-income- population distributions for the census tracts that are within a 10-mile radius of the Project site. The minority population in the census tracts within the 10-mile radius of the Project site makes up 59.7% of this total population. The low-income population in these census tracts accounts for 5.7%. The minority data are from the 2020 U.S. Census, and the income data are from the 2016-2020 American Community Survey 5-year estimates (U.S. Census Bureau 2024b; U.S. Census Bureau 2024c). Figures 5.10a-1 and 5.10a-2, provided in Appendix 5.10A, identify the percent distribution of minority and low-income populations by 2020 census tracts within a 10-mile radius of the Project site.

5.10.1.2 Housing

As shown in Table 5.10-3, housing stock for Alameda County as of January 1, 2024, was 647,509 units. Single-family homes accounted for 379,373 units; multiple-family dwellings accounted for 260,526 units; and mobile homes accounted for 7,610 units (DOF 2024b). As of January 1, 2024, the vacancy rate for Alameda County was 4.9% (DOF 2024b). Because the vacancy rate is below the federal standard vacancy rate of 5%, housing in Alameda County is considered to be limited.

Table 5.10-3. Housing Estimates by County and State, January 1, 2024

Area	Total Units	Single-Family	Multi-Family	Mobile Homes	Percent Vacant
Alameda County	647,509	379,373	260,526	7,610	4.9
California	14,824,827	9,541,239	4,744,173	539,415	6.4

Source: DOF 2024b

As of January 1, 2024, Tracy had a total of 30,681 housing units comprising 25,636 single-family homes, 4,594 multiple-family dwellings, and 451 mobile homes (DOF 2024b). The housing vacancy rate was 3% percent, well below the federal standard vacancy rate of 5%, indicating that housing is limited in Tracy, the closest city to the Project site.

5.10.1.3 Economy and Employment

Alameda County is represented by the Oakland-Hayward-Berkeley Metropolitan District (MD) of the California Employment Development Department (EDD). Between 2018 and 2023, employment in the Oakland-Hayward-Berkeley MD increased by 8,300 jobs, or about 0.1% average annual growth. This 0.1% annual average increase in employment is about a sixth that of California's trend (0.6%) over the same period (EDD 2024a). As shown in Table 5.10-4, on a percentage increase basis, the mining and logging sector, followed by the agricultural and transportation, warehousing, and utilities sectors, experienced the

largest increase in employment, while the wholesale trade and information sectors had the highest reduction. The highest contributions to employment are from the services, government, retail trade, and manufacturing sectors.

Table 5.10-4. Employment Distribution in the Oakland-Hayward-Berkeley MD (Alameda and Contra Costa Counties), 2018 to 2023

Industry	2018		2023		2018-2023	
	Number of Employees	Employment Share (%)	Number of Employees	Employment Share (%)	Percentage Change	Average Annual Compound Growth Rate (%)
Agriculture	1,300	0.1	1,900	0.2	46.2	7.9
Mining and Logging	200	0.0	300	0.0	50.0	8.4
Construction	74,900	6.3	75,100	6.3	0.3	0.1
Manufacturing	100,600	8.5	111,900	9.4	11.2	2.2
Wholesale Trade	47,500	4.0	41,400	3.5	-12.8	-2.7
Retail Trade	114,700	9.7	105,600	8.9	-7.9	-1.6
Transportation, Warehousing, and Utilities	42,300	3.6	54,400	4.6	28.6	5.2
Information	27,600	2.3	24,200	2.0	-12.3	-2.6
Financial Activities	55,300	4.7	50,700	4.3	-8.3	-1.7
Services	542,500	45.9	559,400	47.0	3.1	0.6
Government	174,700	14.8	164,900	13.9	-5.6	-1.1
Total Employment	**1,181,600**	**100.0**	**1,189,900**	**100.0**	**0.7**	**0.1**

Source: EDD 2024a

Note: Numbers may not add up because of independent rounding.

Table 5.10-5 provides details on the characteristics of the civilian labor force. It shows 2023 annual average employment data for the Oakland Hayward Berkeley MD compared to California. The unemployment rate in Oakland Hayward Berkeley MD is less than that for the state. The EDD does not project future unemployment rates.

Table 5.10-5. Employment Data, Annual Average, 2023

Area	Labor Force	Employment	Unemployment	Unemployment Rate (percent)
Oakland Hayward Berkeley MD	1,376,700	1,320,300	56,400	4.1
California	19,308,300	18,388,300	920,000	4.8

Source: EDD 2024a;EDD 2024b

5.10.1.4 Fiscal Resources

The local agency with taxing authority is Alameda County. The County's General Fund expenditures and revenues are presented in Table 5.10-6, which shows that General Fund revenues increased by 4%from fiscal year (FY) 2022 to FY 2023 and from FY 2023 to FY 2024.

Table 5.10-6. Alameda County General Fund Revenues and Expenditures (in $ thousands)

	FY 2022	FY 2023	FY 2024
Expenditures			
General Government	233,590	262,096	233,515
Public Protection	1,032,171	1,145,771	1,163,149
Health and Sanitation	1,074,970	1,120,463	1,151,851
Public Assistance	1,508,509	1,499,109	1,571,844
Public Ways and Facilities	4,444	4,635	4,497
Recreation and Cultural Services	1,102	1,329	1,121
Education	379	626	420
Capital Outlay	6,620	13,540	20,465
Debt Service	0	-	-
Pension Bond Debt Service Transfer	-68,995	-83,678	-80,736
Total Expenditures	**3,792,790**	**3,963,891**	**4,066,126**
Revenues			
Taxes	706,586	769,554	815,195
Licenses and Permits	11,627	11,225	12,285
Fines, Forfeitures & Penalties	9,213	9,159	14,603
Use of Money & Property	13,554	12,206	12,730
State Aid	1,463,606	1,609,538	1,698,393
Federal Aid	618,126	576,401	570,650
Other Aid	78,201	78,684	91,964
Charges for Services	419,970	467,051	461,794
Other Revenues	192,965	135,331	124,202
Total Revenue	**3,513,848**	**3,669,149**	**3,801,816**

Sources: Alameda County 2024b; 2024c; 2024d

Note: Numbers may not add up because of independent rounding.

In FY 2022, taxes made up 20.1% of Alameda County's total General Fund revenues. The contribution of taxes to the County's General Fund revenues increased slightly to 21% during FY 2023 and to 21.4% in FY 2024.

5.10.1.5 Education

There are a total of 17 school districts, one elementary school district and two state special schools in Alameda County (CDE 2025). The area in which Project is located is served by the Mountain House Elementary School District (Mountain House ESD) which is a single-site school district serving K-8th grade and Tracy High School which is part of the Tracy Joint Unified School District (Tracy Joint USD). Past enrollment figures for the Mountain House ESD and the Tracy Joint USD are presented in Table 5.10-7. Although current (2024-2025) enrollment numbers are available from the Mountain House ESD and shown in the table, current enrollment numbers for the Tracy Joint USD are not available. Projected enrollment figures are not available for both school districts.

Table 5.10-7. Historical and Current Enrollment by Grade

Grade Level	Mountain House ESD				Tracy Joint USD		
	(2021-2022)	(2022-2023)	(2023-2024)	(2024-2025)	(2021-2022)	(2022-2023)	(2023-2024)
Kindergarten	4	1	0	2	955	971	1,072
First	0	5	1	1	909	895	846
Second	2	0	4	1	909	910	921
Third	3	2	0	5	955	941	921
Fourth	6	3	1	0	955	971	982
Fifth	1	5	1	3	1,093	986	997
Sixth	0	1	3	2	1,016	1,077	982
Seventh	3	1	1	2	1,063	1,032	1,072
Eighth	1	3	1	1	1,063	1,062	1,027
Ninth	0	0	0	0	1,586	1,472	1,465
Tenth	0	0	0	0	1,709	1,578	1,495
Eleventh	0	0	0	0	1,601	1,684	1,601
Twelfth	0	0	0	0	1,586	1,578	1,737
Total	**20**	**21**	**12**	**17**	**15,398**	**15,155**	**15,115**

Source: CDE 2025

5.10.1.6 Public Services and Facilities

This section describes public services in the Project area.

Law Enforcement

The Project site is under the jurisdiction of the Alameda County Sheriff's Office (ACSO). The Sheriff's Office is headquartered at 1401 Lakeside Drive, 12th Floor, in Oakland. The ACSO Eden Township station, located at 15001 Foothill Blvd., in San Leandro, is the substation that will respond to emergency calls from the project site. The Eden Township substation is approximately 35 miles from the Project site.

The California Highway Patrol is the primary law enforcement agency for state highways and roads (for example, Interstate 5). Services include law enforcement, traffic control, accident investigation, and the management of hazardous material spill incidents.

Fire Protection

The Project site is within the jurisdiction of the Alameda County Fire Department (ACFD). The ACFD is headquartered at 6363 Clark Avenue in Dublin. The ACFD has total of 28 fire stations with a total sworn suppression personnel of 326 including Battalion Chiefs, Captains, Engineers, and Firefighters (Noyes 2024). Station 20 located at 7000 East Livermore Avenue in Livermore serves the Project site. Station 20 also houses Station 8. Station 20 has three firefighters on call 7 days a week during working hours. In an emergency, four more crews of three fighters would be dispatched from Station 20 (Noyes 2024). Response time to an emergency call from the Project site would be approximately 35 minutes (Noyes 2024). The ACFD has a mutual aid agreement with surrounding fire stations.

Emergency Response

The ACFD is responsible for commanding all hazardous materials incidents at the Project site. The hazmat team would be the crew on duty at the time and many individuals/crews are hazmat trained (Noyes 2024).

Hospitals

The nearest hospital to the Project site is the San Joaquin General Hospital (SJGH) located at 500 W. Hospital Road in French Camp. The SJGH is a general acute care facility providing a full range of inpatient services, including General Medical/Surgical Care, High-Risk Obstetrics and Neonatal Intensive Care, Pediatrics, and Intensive Care. The facility has 152 beds (SJGH 2025).

5.10.1.7 Utilities

This section describes public utilities available in the Project area.

Electricity and Gas

Electricity stored at the Viracocha Hill BESS is expected to be connected to the Ralph Substation using a 1,325-foot-long new gen-tie line.

No natural gas lines will be located at the Project.

Water

Project will use water supplied by Zone 7 Water Agency, Byron-Bethany Irrigation District, the City of Livermore, or other approved water district or agency. The water use will be minimal and temporary, primarily associated with construction. Drinking water would be provided via portable water coolers. For more information regarding water supply, see Section 5.15, Water Resources.

Wastewater Discharge

During construction, wastewater will be generated by construction workers use of portable toilets at the construction site. The portable facilities will store wastewater for removal and disposal at an appropriate wastewater facility. The amount of wastewater generated will be accommodated by existing wastewater facilities.

5.10.2 Environmental Analysis

This section assesses the potential environmental impacts of the Project and linear facilities.

5.10.2.1 Potential Environmental Impacts

Local environmental impacts were determined by comparing Project demands during construction and operation with the socioeconomic resources of the region of influence (that is, Alameda County). A proposed facility could impact employment, population, housing, public services and utilities, and schools. Impacts could be local or regional, although generally impacts tend to be more local (county) than regional (outside the county).

5.10.2.2 Significance Criteria

The criteria used to determine the potential significance of Project-related socioeconomic impacts are set forth in Appendix G of the California Environmental Quality Act Guidelines. Project-related impacts from construction and operations of the facility are potentially significant if they:

- Induce substantial unplanned population growth or concentration of population
- Displace a large number of people or impact existing housing necessitating the construction of replacement housing elsewhere
- Result in substantial adverse impacts on the local economy and employment
- Create adverse fiscal impacts on the community
- Result in substantial adverse impacts on educational facilities
- Result in substantial adverse impacts on the provision of utility services
- Result in substantial adverse impacts associated with the provision of public services

Other impacts may be significant if they cause substantial change in community interaction patterns, social organization, social structures, or social institutions; substantial conflict with community attitudes, values, or perceptions; or substantial inequities in the distribution of the Project cost and benefit.

5.10.2.3 Construction Impacts

The overall project schedule for the Project construction and commissioning is expected to take approximately 14 months. Construction is expected to commence in the third quarter of 2026.

Construction Workforce

The primary trades required for construction will include craft workforce such as carpenters, laborers, equipment operators, electricians, cement finishers, and painters. Table 5.10-8 provides an estimate of craft personnel requirements for the facility's construction.

Total construction personnel requirements will be approximately 527 person-months over the 14-month construction period. Construction personnel requirements will peak at approximately 84 workers in months 8 and 9 of the construction period. Average workforce over the 14-month construction period is about 38 workers.

Available skilled labor in the Oakland-Hayward-Berkeley MD was evaluated by surveying the Building and Trades Council (Table 5.10-9) and contacting EDD (Table 5.10-10). Both sources show that the workforce in the Oakland-Hayward-Berkeley MD will be adequate to fulfill Project's construction labor requirements. Therefore, the Project will not place an undue burden on the local workforce. As shown in Table 5.10-4, the construction workforce in the Oakland-Hayward-Berkeley MD increased over the last 5 years at an annual rate of 0.1%. The additional workforce requirement by the Project is still not expected to place undue burden because the Project is in the Bay Area, which has a large construction workforce.

Table 5.10-8. Construction Workforce Personnel by Month

Construction Craft Labor	Months														Person Months	Days/ Month	Person Days
	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
Carpenters		5	5	5	5										20	23	460
Laborers/Equipment Operators	10	10	10	10	10										50	23	1150
Teamsters															0	23	0
Electricians				10	20	30	40	76	76	40	28	8	8	8	344	23	7912
Cement Finishers			5	5	5										15	23	345
Painters															0	23	0
Total Craft Labor	**10**	**15**	**20**	**30**	**40**	**30**	**40**	**76**	**76**	**40**	**28**	**8**	**8**	**8**	**429**	**23**	**9867**
Total Supervision	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**6**	**4**	**4**	**4**	**98**	**23**	**2254**
Total Manpower	**18**	**23**	**28**	**38**	**48**	**38**	**48**	**84**	**84**	**48**	**34**	**12**	**12**	**12**	**527**	**23**	**12121**

Notes:

Table 2-3 includes both estimated construction workforce as well as estimated decommissioning/closure workforce. Table 5.10-8 only includes estimated construction workforce.

Table 5.10-9. Labor Union Contacts in Alameda County

Labor Union	Contact	Phone Number
Alameda County Building Trade Council	Andreas Culver, Secretary-Treasurer	(510) 430-8664

Table 5.10-10. Available Labor by Skill in Oakland-Hayward-Berkeley MD, 2020-2030

Occupational Title	Annual Averages		Absolute Change	Percentage Change	Average Annual Compounded Growth Rate (%)
	2020	2030			
Carpenters	9,320	10,220	900	9.7	1.5
Cement Masons and Concrete Finishers	1,520	1,600	80	5.3	0.7
Painters, Construction, and Maintenance	5,460	6,270	810	14.8	3.0
Electricians	6,070	7,160	1,090	18.0	4.2
Industrial Truck and Tractor Operators	4,700	5,850	1,150	24.5	7.9
Operating Engineers and Other Construction Equipment Operators	2,130	2,410	280	13.1	2.4
Helpers, Construction Trades	1,510	1,660	150	9.9	1.6
Construction Laborers	11,090	12,960	1,870	16.9	3.8
Administrative Services Managers	3,490	4,010	520	14.9	3.0
Engineers	20,760	24,140	3,380	16.3	3.5
Engineering Technicians	3,540	4,060	520	14.7	2.9

Source: EDD 2024c

Induce Substantial Growth or Concentration of Population

It is anticipated that most of the construction workforce will be drawn from Alameda County. However, a portion of the construction workforce could also be drawn from other nearby counties. Because the proposed Project site is near Contra Costa and San Joaquin counties, construction workers are assumed to come from one of the three counties. Thus, for purposes of this analysis, about one-third of the construction workforce is conservatively assumed to be from Alameda County while the other two-thirds are assumed to come from Contra Costa and San Joaquin counties. Because most workers are expected to commute to the Project site, they will not contribute to a significant increase in the population of the area.

Displace a Large Number of People or Impact Existing Housing

The construction workforce will most likely commute daily to the Project site; however, if needed, there are hotels/motels in nearby cities Alameda County and the neighboring counties in the San Francisco Bay Area (that is, the nine counties that are included in the Association of Bay Area Governments) to accommodate workers who may choose to commute to the Project site on a workweek basis. In addition to the available hotel/motel accommodations, there are recreational vehicle parks and campgrounds close to the Project site and the Project construction crew camps in the immediate vicinity. As a result, construction of the Project is not expected to significantly increase the demand for housing.

Result in Substantial Adverse Impacts on the Local Economy and Employment

The capital cost for the Project is estimated to be between $136 million. The estimated value of materials and supplies that will be purchased locally during construction is estimated to be between $5 million and $10 million. All cost estimates are in constant 2024 dollars, as are the economic benefits figures cited later in this section.

The Project will provide about $5 million to $7 million in construction payroll, at an average rate of $60 to $70 per hour, including benefits. The anticipated payroll for employees, as well as the purchase of materials and supplies during construction, will have a slight beneficial impact in Alameda County. It is expected that approximately $1.65 million to $2.31 million[1] of the construction payroll will stay in the local area (that is, Alameda County) during the 14-month construction period. These additional funds will cause a temporary beneficial impact by creating the potential for other employment opportunities for local workers in other service areas, such as transportation and retail. No significant adverse impacts are expected to result related to the local economy and employment.

Indirect and Induced Economic Impacts from Construction. Construction activities will result in secondary economic impacts (indirect and induced impacts) within Alameda County. Indirect and induced employment effects include the purchase of goods and services by firms involved with construction, and induced employment effects, include construction workers spending their income within the county. In addition to these secondary employment impacts, there are indirect and induced income effects arising from construction.

Indirect and induced impacts were estimated using an IMPLAN input/output model of the Alameda County economy. The IMPLAN model package includes county-level data to describe the local economy in a given year (in this case 2023) and an online platform. The estimated annual indirect employment within Alameda County will be between 25 and 41 jobs, while the estimated annual induced employment will be between 5 and 9 jobs. These additional jobs result from the $4.29 million to $8.57million in annual local construction expenditures[2] and the $1.41 million to $1.98 million in annual spending by local construction workers. The $1.41 million to $1.98 million represents the local portion of the annual construction payroll (here assumed to be 33% of the $5 million to $7 million[3]). Assuming an annual average direct construction employment of 441, the employment multiplier associated with the construction phase of the project is approximately between 1.07 ([441 + 25 + 5]/441) and 1.12 ([441 + 41 +]/441). This construction phase employment multiplier is based on a Type Social Accounting Matrix (SAM) model.

Indirect income impacts were estimated to be between $2.21 million and $3.57 million, while induced income impacts were estimated to be between $417,000 and $720,100. Assuming a total annual local construction expenditure (that is, payroll, materials, and supplies) of approximately $5.7 million ($1.41 million in payroll plus $4.29 million in materials and supplies), the construction phase income multiplier based on a Type SAM model is approximately 1.46 ([$5,700,000 + $2,208,600 + $417,100]/$5,700,000). Assuming a total annual local expenditure (that is, payroll, materials, and supplies) of approximately $10.55 million ($1.98 million in payroll plus $8.57 million in materials and supplies), the construction phase income multiplier based on a Type SAM model is approximately 1.41 ([$10,551,400 + $3,568,700 + $720,100]/$10,551,400)

Create Adverse Fiscal Impacts in the Community

The capital cost for the Project is estimated to be $136 million. The estimated value of materials and supplies that will be purchased locally (within Alameda County) during Project construction is between $5 million and $10 million. The effect on fiscal resources during construction will be from sales taxes realized on equipment and materials purchased in the county and from sales taxes from other

[1] $5,000,000 x 33% =$1,650,000; $7,000,000 x 33% = $2,310,000

[2] Annual local construction expenditures =$5 million/(14/12) = $4.29 million; $10 million/(14/12) = $8.57 million.

[3] Annual local portion of construction payroll = $5 million/(14/12) x 33% = $1.41 million; $7 million/(14/12) x 33%= $1.98 million.

expenditures. The purchases of equipment and materials are assumed to be made within the county. The sales tax rate in Alameda County is 10.25% as of January 1, 2025 (CDTFA 2025). Of this, 7.25% goes to the state, 1.50% goes to County operations, 1% goes to County transportation funds, and 0.5% percent goes to the Bay Area Rapid Transit district (CDTFA 2025). The total local sales tax expected to be generated during construction is $512,500 to $1,025,000 (10.25% of local sales). Assuming all local sales are made in Alameda County, the estimated sales tax the county could receive will be between $150,000 and $300,000 (3% of local construction expenditures of $5 million to $10 million) during the construction period. No significant adverse fiscal impacts are expected to result from Project construction.

Result in Substantial Adverse Impacts on Educational Facilities

The Mountain House ESD is not currently considered overcrowded (Jokela 2024). Project construction will not cause significant population changes or housing impacts on the region because most construction workers will commute to the Project site from areas within the county or from the greater San Francisco Bay Area, as opposed to relocating to the area. As a result, Project construction will not cause a significant increase in demand for school services.

Result in Substantial Adverse Impacts on Provision of Utility Services

Project construction will not make significant adverse demands on local water, sanitary sewer, or electricity. Water requirements for construction are relatively small. Given the number of workers, the use of portable toilets and the temporary duration of the construction period, there will be no impacts on the local sanitary sewer system.

Result in Substantial Adverse Impacts on the Provision of Public Services

Project construction may have minor impacts on police, fire, or hazardous materials handling resources. However, construction is not expected to place a burden on public service providers. Construction sites may hold a higher risk of emergency because of the types of activities taking place. However, with the implementation of safety procedures for the construction site as required by applicable regulations and standards, Project construction is not expected to create significant adverse impacts on public services in the area.

5.10.2.4 Operational Impacts

This section discusses the potential changes to the local economy as a result of Project operations.

Operational Workforce

The Project will have no onsite employees. Monthly inspections will be conducted by one to two operation staff shared among the BESS and other Applicant-owned facilities in the area.

Induce Substantial Growth or Concentration of Population

Because there will be no onsite operational employees, there will be no changes in the population of the immediate area of the Project site and, assuming that the one to two operation staff relocate from outside Alameda County, the addition of two operation staff would only lead to a population change of about six[4] people. The addition of six people would be insignificant when compared to the county's total 2024 population of about1.6 million (see Table 5.10-1).

[4] The two operations staff multiplied by 2.58 (the persons per households in Alameda County in 2024).

Displace a Large Number of People or Impact Existing Housing

Based on the housing vacancy data in Table 5.10-3, there are31,728 available housing units in Alameda County for the two operations staff, assuming that they relocate from outside the county. Therefore, the operation of the Project will neither induce substantial growth or concentration of population, nor displace a large number of people or impact existing housing.

Result in Substantial Adverse Impacts on the Local Economy and Employment

Project operation will generate a permanent beneficial impact by creating employment opportunities for workers through local expenditures for materials (for example, maintenance materials, office supplies and services, and payroll). There will be an annual operations and maintenance (O&M) budget on materials, supplies, and services of approximately $3.6 million, all of which is estimated to be spent locally (that is, within Alameda County). There will also be an annual payroll of $400,000 to $450,000, all of which is also expected to be spent within Alameda County. The additional spending will generate long-term employment opportunities and spending in Alameda County. All cost estimates are in constant 2024 dollars, as are the economic benefits noted in this section. No adverse impacts on the local economy and employment are expected to result from Project operations.

Indirect and Induced Economic Impacts from Operations. Operation of the Project will result in indirect and induced economic impacts that will occur within Alameda County and elsewhere. The indirect and induced impacts will result from annual expenditures on payroll and O&M.

The estimated indirect and induced employment within Alameda County from Project economic activity will be one and seven permanent jobs, respectively. The indirect income impacts are estimated at $837,400 to $887,400, while the induced income impacts are estimated at $110,100 to $115,400. These additional jobs and income result from the $4 million and $4.05 million in annual O&M budget and payroll. [5]

Create Adverse Fiscal Impacts on the Community

The annual O&M budget, excluding payroll, is expected to be approximately $3.6 million (in 2024 dollars), all of which is assumed to be spent locally within Alameda County.

During operations, additional sales tax revenues will be obtained by Alameda County on the approximately $3.6 million in annual local O&M expenditures. The estimated sales tax revenues generated annually from the $3.6 million in annual O&M expenditures will be $369,000. Though not significant, the overall anticipated increase in sales tax revenue of about 0.01% of the County's FY 2024 total General Fund revenues of $3,801.8 million (Table 5.10-6) will be beneficial.

The Project will bring increased property tax revenue to Alameda County. The property tax rate for the proposed site is 1.1011% for FY 2024 (Alameda County 2025). Assuming a capital cost of $136 million, the Project will generate approximately $1.5 million in property taxes annually. Because the property taxes are collected at the County level, their disbursement is also at the County level.

In FY 2024, Alameda County's total General Fund revenues were estimated at $3,801.8 million (Table 5.10-6). Of this amount, $815.2 million was in tax revenues. The increase in tax revenues resulting from the Project will be less than 0.1% of the County's FY 2024 General Fund total revenues and about 0.2% of the County's FY 2024 tax revenues. The overall anticipated increase in property tax revenue will be slight but beneficial.

[5] $3.6 million in annual O&M expenditures plus $400,000 in annual O&M payroll.

Result in Substantial Adverse Impacts on Educational Facilities

The schools in the Mountain House ESD are currently not overcrowded (Jokela 2025). Any industrial development in the Mountain House ESD is charged a one-time developer fee of $0.84 per square foot of commercial development (Jokela 2024). Because the Project does not include any occupied buildings, no school impact fees will be assessed by the school.

Result in Substantial Adverse Impacts on Provision of Utility Services

Project operation will not make significant adverse demands on local water, sanitary sewer, or electricity because adequate supply and capacity currently exist.

Result in Substantial Adverse Impacts on the Provision of Public Services

The Project's operation is not expected to result in any significant impacts on either the ACFD or the ACSO. Because there will be no onsite operational employees the Project's operation will not create significant adverse impacts on medical resources in the area. Copies of the records of conversation with the police and fire departments are included in Appendix 5.10B.

Environmental Justice

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which required federal agencies to consider whether the project may result in disproportionately high and adverse human health or environmental effects on any minority or low-income population by performing an environmental justice analysis, was rescinded on January 20, 2025. Although EO 12898 can no longer be the basis for conducting environmental justice impacts at the federal level, California law, which defines environmental justice as "the fair treatment of people of all races, cultures and income with respect to development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Gov. Code, § 65040.12) is applicable.

Beyond the fair treatment principles described in statute, the California Energy Commission (CEC) considers environmental justice as part of its environmental review of power plant cases. The CEC uses the California Environmental Protection Agency's (CalEPA) California Communities Environmental Health Screening Tool (CalEnviroScreen) in addition to U.S. Census data to identify minority and low-income populations as a disadvantaged community by CalEnviroScreen. The environmental justice (EJ) analysis for the Viracocha Hill BESS project did not use the CalEnviroScreen tool but is based on the evaluation of the presence of a minority or low-income population within a 10-mile radius (the distance previously established by the CEC for power plant siting) and the determination of high and adverse impacts on these populations. The CEC conducts EJ analysis by following a four-step screening process:

1. Identification of a population of minority persons and/or persons with low income (that is, disadvantaged community), living in an area potentially affected by the proposed project
2. Providing notice in appropriate languages (when possible) of the proposed project and opportunities for participation in public workshops for disadvantaged communities
3. Identification of areas potentially affected by various project-related emissions (such as, air quality, greenhouse gases, and hazardous materials or other project-related nuisance effects (such as, noise and traffic)
4. A determination of the potential for significant adverse disproportionate impact on an identified EJ population resulting from the proposed project alone, or in combination with other existing or planned projects in the area (that is, from cumulative impacts)

A screening-level analysis of EJ is presented in Appendix 5.10A. As indicated in this application and as summarized in that analysis, the Project does not create any significant adverse, disproportionate impacts

on the identified EJ population. Therefore, there are no significant adverse environmental impacts that are likely to fall disproportionately on minority and/or low-income members of the community."

5.10.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code Section 21083; Title 14, California Code of Regulations, Sections 15064[h], 15065[c], 15130, and 15355). Cumulative socioeconomic impacts may occur when more than one project has an overlapping construction schedule that creates a demand for workers that cannot be met by local labor, resulting in an influx of nonlocal workers and their dependents and resulting in excessive demand on public services.

Table 2-9 provides a list of projects currently under development. Although the various projects may require a labor supply agreement for construction in roughly the same time period, there is a sufficient supply of skilled labor in Alameda County, according to union officials. Additional workforce needs are also likely to be met from the Oakland-Hayward-Berkeley MD areas and the larger nine-county Bay Area region, which has a large construction workforce. Other kinds of cumulative socioeconomic impacts are also unlikely because the Project's effects on housing, schools, and public services will be negligible.

5.10.4 Mitigation Measures

Because there are no significant adverse impacts caused by the Project, no socioeconomic-specific mitigation measures are proposed. Additionally, because the Project will not have any onsite operational employees, no school impact fees will be assessed.

5.10.5 Laws, Ordinances, Regulations, and Standards

A summary of the LORS, including the Project's conformance to them, is presented in Table 5.10-12.

Table 5.10-12. LORS for Socioeconomics

LORS	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Federal			
Civil Rights Act of 1964	Prohibits discrimination on the basis of race, color, or national origin. Applies to all federal agencies and agencies receiving federal funds.	Office of Civil Rights	Section 5.10.2
State			
Government Code Sections 65996-65997	Establishes that the levy of a fee for construction of an industrial facility be considered mitigating impacts on school facilities. Mountain House ESD may charge a one-time assessment fee to mitigate potential school impacts; however, it is not applicable to the Project.	Alameda County Office of Education	Section 5.10.2.4

LORS	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Education Code Section 17620	Allows a school district to levy a fee against any construction within the boundaries of the district for the purpose of funding construction of school facilities. Mountain House Elementary School District may charge a one-time assessment fee to mitigate potential school impacts; however, it is not applicable to the Project.	CDE	Section 5.10.2.4
Local			
County of Alameda General Plan (2015)	Goal: Encourage adequate industrial uses to develop within the incorporated cities, unincorporated urban centers, and designated industrial Existing Communities to meet the manufacturing, processing, fabrication, and service needs of the local, regional, and global economy, and to meet the employment needs of county residents. Applies to facilities constructed and operated within the Alameda County boundaries.	Alameda County	Section 5.10.5.3

5.10.5.1 Federal LORS

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which required federal agencies to consider whether a project may result in disproportionately high and adverse human health or environmental effects on any minority or low-income population by performing an environmental justice analysis was rescinded on January 20, 2025.

5.10.5.2 State LORS

Government Code Sections 65996 and 65997 provide the exclusive methods of considering and mitigating impacts on school facilities that might occur as a result of the development of real property. Education Code Section 17620, listed in Government Code Section 65997 as an approved mitigation method, allows school districts to levy a fee or other requirement against construction within the boundaries of the school district for the purpose of funding construction of school facilities.

5.10.5.3 Local LORS

Alameda County

The Alameda County East County Area Plan (ECAP) (2000) is the portion of the Alameda County General Plan that is applicable to the Project. The ECAP includes a goal that calls for the promotion of economic development. Policy 44 states that the County "shall encourage a diversity of job producing industries that reflect the skills of the local labor force to locate to the East County area." Program 14 under Economic Development calls for the County to work with the Alameda County Economic Development Advisory Board to recruit industry for the East County planning area.

5.10.6 Agencies and Agency Contacts

Table 5.10-13 provides a list of agencies and contacts of potentially responsible agencies. Copies of records of conversation are provided in Appendix 5.10B.

Table 5.10-13. Agency Contacts for Socioeconomics

Issue	Agency	Contact
School impact fees, enrollment data, potential enrollment impacts	Mountain House ESD	Kimberly Jokela School Administrator 3950 Mountain House Road., Byron, CA 94514 (209) 835-2283 kimberly.jokela@mtnhouse.k12.ca.us
Available resources, potential impacts on resources and average response times	Alameda County Sheriff's Office	County Sheriff 15001 Foothill Blvd. San Leandro, CA 94578 (510) 272-6878 mpetrini@acgov.org
Available resources, potential impacts on resources and average response times	Alameda County Fire Department	Amy Noyes Specialist Clerk 6363 Clark Avenue Dublin, CA 94568 (925) 833-3473 Ext. 1128
Availability of labor	Alameda County Building Trades Council	Andreas Culver Secretary-Treasurer 7750 Pardee Lane, Oakland, CA 94621 (510) 430-8664 btca@btcalameda.org

5.10.7 Permits and Permit Schedule

Permits dealing with the effects on public services are addressed as part of the building permit process. For example, school development fees are typically collected when Project pays in lieu building permit fees to the county. No permits are required to comply with the socioeconomic impacts of the Project.

5.10.8 References

Alameda County. 2000. *East County Area General Plan*. https://acgov.org/cda/planning/generalplans/documents/EastCountyAreaPlancombined.pdf.

Alameda County. 2024a. Alameda County: This is Who We Are. Available online: https://www.acgov.org/about/. Accessed December 23.

Alameda County. 2024b. Annual Comprehensive Financial Report for Fiscal Year Ended June 30, 2024. https://auditor.alamedacountyca.gov/plans-reports-annual-comprehensive-financial-reports/. Accessed December 4.

Alameda County. 2024c. Annual Comprehensive Financial Report for Fiscal Year Ended June 30, 2023. https://auditor.alamedacountyca.gov/plans-reports-annual-comprehensive-financial-reports/. Accessed December 4.

Alameda County. 2024d. Annual Comprehensive Financial Report for Fiscal Year Ended June 30, 2022. https://auditor.alamedacountyca.gov/plans-reports-annual-comprehensive-financial-reports/. Accessed December 4.

Alameda County. 2025. Alameda County Auditor-Controller Clerk-Recorder: Property Tax – Tax Rate Search. https://auditor.alamedacountyca.gov/tax-rate-search/. Accessed March 27.

California Department of Tax and Fee Administration (CDTFA). 2025. California City and County Sales and Use Tax Rates Available online: https://www.cdtfa.ca.gov/formspubs/cdtfa95.pdf. Accessed March 28.

California Department of Education (CDE). 2025. Data and Statistics, DataQuest – District level Enrollment. Available online: http://dq.cde.ca.gov/dataquest. Accessed March 25.

California Department of Finance (DOF). 2024a. Demographic - Estimates. *E-5 Population and Housing Estimates for Cities, Counties and the State, January 2020-2024, with 2020 Benchmark.* Available online: https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2024/. Accessed December 5.

California Department of Finance (DOF). 2024b. Demographic - Estimates. *E-4 Population Estimates for Cities, Counties, and the State, 2001-2010, with 2000 & 2010 Census Counts*. Available online: https://dof.ca.gov/forecasting/demographics/estimates/estimates-e4-2000-2010/. Accessed December 23.

California Department of Finance (DOF). 2024c. Demographic - Estimates. *E-4 Population Estimates for Cities, Counties, and the State, 2011-2020, with 2010 Census Benchmark*. Available online: https://dof.ca.gov/forecasting/demographics/estimates/e-4-population-estimates-for-cities-counties-and-the-state-2011-2020-with-2010-census-benchmark-new/. Accessed December 23.

California Department of Finance (DOF). 2024d. P-2A: Total Population for California and States *(2020-2070)*. Available online: https://dof.ca.gov/forecasting/demographics/projections/. Accessed December 5.

California Employment Development Department (EDD). 2024a. Employment by Industry Data. *Oakland-Hayward-Berkeley Metropolitan District (MD) – Historical Annual Average Data, 1990-2023*. Available online: https://www.labormarketinfo.edd.ca.gov/data/employment-by-industry.html. Accessed December 5.

California Employment Development Department (EDD). 2024b. Employment by Industry Data. *California – Historical Annual Average Data, 1990-2023*. Available online: http://www.labormarketinfo.edd.ca.gov/data/employment-by-industry.html. Accessed December 5.

California Employment Development Department (EDD). 2024c. Occupational Employment Projections. Available online: http://www.labormarketinfo.edd.ca.gov/data/employment-projections.html. Accessed December 5.

California Employment Development Department (EDD). 2024d. Industry Projections. Available online: http://www.labormarketinfo.edd.ca.gov/data/employment-projections.html. Accessed December 5.

Culver, A. 2025. Personal communication between Fatuma Yusuf of Jacobs and Andreas Culver, Secretary-Treasurer, Alameda County Building Trades Council. April 23.

Jokela, K. 2025. Personal communication between Fatuma Yusuf of Jacobs and Kimberly Jokela, School Administrator, Mountain House Elementary School District. March 27.

Noyes, A. 2024. Personal communication between Annie Wollmuth of Jacobs and Amy Noyes, Specialist Clerk, Alameda County Fire Department. December 17.

San Joaquin General Hospital (SJGH). 2025. Available online: https://www.sanjoaquingeneral.org/the-hospital. Accessed March 28.

U.S. Census Bureau. 2024a. Alameda County Profile. Available online: https://data.census.gov/profile/Alameda_County,_California?g=050XX00US06001. Accessed December 23.

U.S. Census Bureau. 2024b. 2020 Redistricting Data SF (PL 94-171) – *Hispanic or Latino, and Not Hispanic or Latino By Race*. Available online: http://factfinder2.census.gov/. Accessed December 12.

U.S. Census Bureau. 2024c. 2020 American Community Survey (ACS) 5-Year Estimates – *Poverty in the Past 12 Months*. Available online: http://factfinder2.census.gov/. Accessed December 12.

5.11 Soils and Agricultural Resources

Section 5.11 Soils and Agricultural Resources was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.12 Traffic and Transportation

Section 5.12 Traffic and Transportation was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.13 Visual Resources

This section describes the existing landscape (natural and built) surrounding the Viracocha Hill Battery Energy Storage System Project (Viracocha Hill BESS or Project) and the potential visual impacts associated with its construction and operation. For the purposes of this analysis, visual resources consist of the natural and built features of the landscape that can be seen and that contribute to the public's experience and appreciation of the environment. Natural landscape features include landforms, water, and vegetation patterns, whereas built features such as buildings, roads, structures, and artificial lighting reflect human or cultural modifications. The character and quality of the visual environment has a value to individuals, society, and the economy of a region, particularly in an area where scenic landscapes provide the backdrop for tourism and recreation activities. Visual resource impacts are generally defined in terms of the Project's physical characteristics and potential visibility and the extent to which its presence would alter the perceived visual character and quality of the environment.

Consistent with the California Energy Commission (CEC) Updates to Appendix B – Application Requirements (see 20 California Code of Regulations [CCR] Division 2, Chapter 5, Appendix B, (g)(6) Visual Resources), this section evaluates whether the Project would conflict with applicable zoning and other local regulations governing scenic quality. This section was prepared in accordance with CEC guidelines for preparing visual impact assessments for Opt-In Applications and, as such, includes a thorough investigation of scenic resources (that is, scenic vistas, highways, overlooks, parks, and trails) within a 5-mile radius area centered on the Project. Identified resources including sensitive built environment resources/structures, scenic vistas, state-designated scenic highways and locally designated scenic roads, scenic overlooks, waterbodies, and public trails and parks were mapped and are presented in Section 5.13.1.1. The analysis also conforms with the documentation requirements of the California Environmental Quality Act (CEQA) (California Public Resources Code, Section 21000 et seq.). Despite the presence of scenic resources within 5 miles of the Project, this section focuses on resources (that is, views and existing visual character) located near the Project that are likely to be affected by implementation of the Project.

Section 5.13.1 documents the visual conditions that exist in the Project area. Section 5.13.2 includes a description of the methods used to prepare this analysis, as well as potential environmental effects as they relate to visual resources. Section 5.13.3 discusses the potential cumulative impacts of this and other projects in the area. Section 5.13.4 summarizes the mitigation measures proposed to reduce Project impacts on visual resources. Section 5.13.5 describes the applicable laws, ordinances, regulations, and standards (LORS) relevant to visual resources. Section 5.13.6 lists agencies involved and agency contacts, and Section 5.13.7 discusses permits. Section 5.13.8 lists the references used in preparation of this section.

5.13.1 Affected Environment

5.13.1.1 Regional Setting

The regional setting features varied topography, including rolling hills associated with the north-south oriented Southern Pacific Coast Ranges, which extend from the San Francisco Bay Area to Santa Barbara County. Near the Project, several valleys are intermixed including Santa Clara Valley and Livermore Valley to the west, and San Joaquin Valley to the east. Notable water features include the Pacific Ocean and San Francisco Bay to the west, and Suisun Bay and the Sacramento-San Joaquin River Delta to the north. Smaller water reservoirs are common throughout the region. Intense residential and commercial development is located in the valleys, while sparse development is located in the rolling hills. There are sophisticated transportation networks and recreational amenities in the valleys, but limited transportation and recreational opportunities in the rolling hills. Scenic resources within 5 miles of the Project are listed in Table 5.13-1 and shown on Figure 5.13-1.

Table 5.13-1. Scenic Resources within 5 Miles of the Project Site

Scenic Resource	Description and Approximate Distance from Project Site
Sensitive Visual Resources – Natural Environment	
Altamont Pass	This area is a low mountain pass in the Diablo Range of Northern California between the Livermore Valley and the San Joaquin Valley. Several transportation facilities cross through this area, including Interstate 580 (I-580), Altamont Pass Road, and a Union Pacific rail line. The rolling hills range from low of 300 feet to just over 1,000 feet. The Project is located in the Altamont Pass.
Bethany Reservoir	Bethany Reservoir is jointly managed by the California Department of Water Resources, California Department of Fish and Wildlife, and California Department of Parks and Recreation. This 160-acre reservoir is within the Bethany Reservoir State Recreation Area and is the beginning the of the California Aqueduct system. At its nearest point, the Bethany Reservoir is approximately 0.5 mile east of the Project.
Sensitive Visual Resources – Built Environment	
California Aqueduct	The 400-mile aqueduct is a system of canals, tunnels, and pipelines that conveys water collected from the Sierra Nevada and valleys of Northern and Central California to Southern California. It is located on the eastern side of the Project and flows through the Bethany Reservoir. At its nearest point, the California Aqueduct is approximately 0.8 mile east of the Project.
Historic Era Ranch Complex (CA-ALA-441H)	This location has buildings, foundations/structure pads, and water conveyance systems, and was determined to be ineligible for listing in the National Register of Historic Places in1983. At its nearest point, the historic ranch complex is approximately 1 mile north and east of the Project. Note this ranch is not shown on Figure 5.13-1 to protect its location.
Trails	
Mountain House Creek Trail	The 3.1-mile trail in Mountain House Creek Park has a dirt running path on the west and a paved bicycle path on the east. Along the park there are playgrounds, picnic areas, and benches. At its nearest point, the Mountain House Creek Trail is approximately 3.2 miles east of the Project.
California Aqueduct Bikeway	Starting at the Bethany Reservoir, the California Aqueduct maintenance roads allow bicycles. At each gate is a special opening to allow just bicycles through. Each time the canal comes to a road, riders must walk their bikes through the gate, across the road, and then back through the gate onto the canal road. During the first 20 miles the roads are frequent, but during the last 40 miles the gate crossing are fewer and fewer. There are limited services along the bikeway. At its nearest point, the California Aqueduct Bikeway is approximately 0.8 mile east of the Project.
Scenic Lookout	
Top of the World	Provides sweeping views through a series of rolling hills in the Altamont Pass area. Wind turbines and transmission towers and lines occupy the hilltops. Distant buildings and facilities are difficult to discern due to distance. At its nearest point, the Top of the World Scenic Lookout is approximately 5 miles southwest of the Project.
Scenic Routes/Highways	
San Joaquin County I-580 (officially designated)	Caltrans identifies I-580 in San Joaquin County south of the I-205 interchange to Highway 152 as an "officially designated" State Scenic Highway. This type of highway has an adopted corridor management plan and is part of the Scenic Highway System. This portion of I-580 is approximately 5 miles southeast of the Project.

Scenic Resource	Description and Approximate Distance from Project Site
Alameda County I-580 (eligible)	Caltrans identifies I-580 in Alameda County south of the Project area from San Leandro to the I-205 interchange as an "eligible" State Scenic Highway. This type of highway does not have an adopted corridor management plan but is part of the Scenic Highway System. This portion of I-580 is approximately 2 miles south of the Project.
Parks	
Bethany Reservoir State Recreation Area	This 608-acre park has a 160-acre reservoir with a boat ramp, fishing, bicycling, and picnic tables. The park is also the northern terminus of the California Aqueduct. At its nearest point, the Bethany Reservoir State Recreation Area is approximately 0.5 mile east of the Project.
Brushy Creek Regional Preserve	This 1,976-acre preserve has the following amenities: hiking, bicycling, and horseback riding. The Brushy Peak Native American Cultural District (P-01-01111) is located within the preserve. At its nearest point, the Brushy Creek Regional Preserve is approximately 3.3 miles west of the Project.
Vasco Caves Regional Preserve	This 1,644-acre preserve is open to the public on a restricted basis. It has unique rock outcrops and areas for hiking. At its nearest point, the Vasco Caves Regional Preserve is approximately 4.2 miles northwest of the Project.
Hansen Village Park	This park features a children's playscape, baseball diamond, open athletic fields, picnic tables, bar-b-que grills, and bathrooms. At its nearest point, the Hansen Village Park is approximately 3.7 miles east of the Project in the city of Mountain House.
Cordes Pocket Park	This park features picnic tables and bar-b-que grills. At its nearest point, the Cordes Pocket Park is approximately 4.2 miles east of the Project in the city of Mountain House.
Cordes Village Park	This park features a baseball diamond, open athletic fields, picnic tables, bar-b-que grills, and bathrooms. At its nearest point, the Cordes Village Park is approximately 4.2 miles east of the Project in the city of Mountain House.
Bethany Park	This park features an open athletic field, basketball court, picnic tables, and bar-b-que grills. At its nearest point, the Bethany Park is approximately 3.7 miles east of the Project in the city of Mountain House.
Mountain House Creek Park	This park features the 3.1-mile Mountain House Creek Trail with a dirt running path on the west and a paved bicycle path on the east, as well as picnic tables, bar-b-que grills, and bathrooms. At its nearest point, the Mountain House Creek Park is approximately 3.2 miles east of the Project.
Wicklund Park	This park features a gazebo, children's playscape, baseball diamond, horseshoe pits, covered picnic area, picnic tables, and bar-b-que grills. At its nearest point, the Central Community Park is approximately 4.5 miles east of the Project in the city of Mountain House.
Central Community Park	This park features an interactive fountain, children's playscape, baseball diamond, basketball courts, bocce courts, cricket pitch, tennis courts, covered picnic area, picnic tables, bar-b-que grills, and bathrooms. At its nearest point, the Central Community Park is approximately 4.3 miles east of the Project in the city of Mountain House.
Altamont Park	This park features a baseball diamond, open athletic field, picnic tables, and bar-b-que grills. At its nearest point, the Altamont Park is approximately 4 miles east of the Project in the city of Mountain House.

Scenic Resource	Description and Approximate Distance from Project Site
Questa Pocket Park	This park features a children's playscape, open athletic field, picnic tables, and bar-b-que grills. At its nearest point, the Questa Pocket Park is approximately 4.3 miles east of the Project in the city of Mountain House.
Questa Park	This park features a children's playscape, baseball diamond, basketball courts, bocce courts, open athletic fields, covered picnic area, picnic tables, and bar-b-que grills. At its nearest point, the Questa Park is approximately 4 miles east of the Project in the city of Mountain House.

5.13.1.2 Local Setting

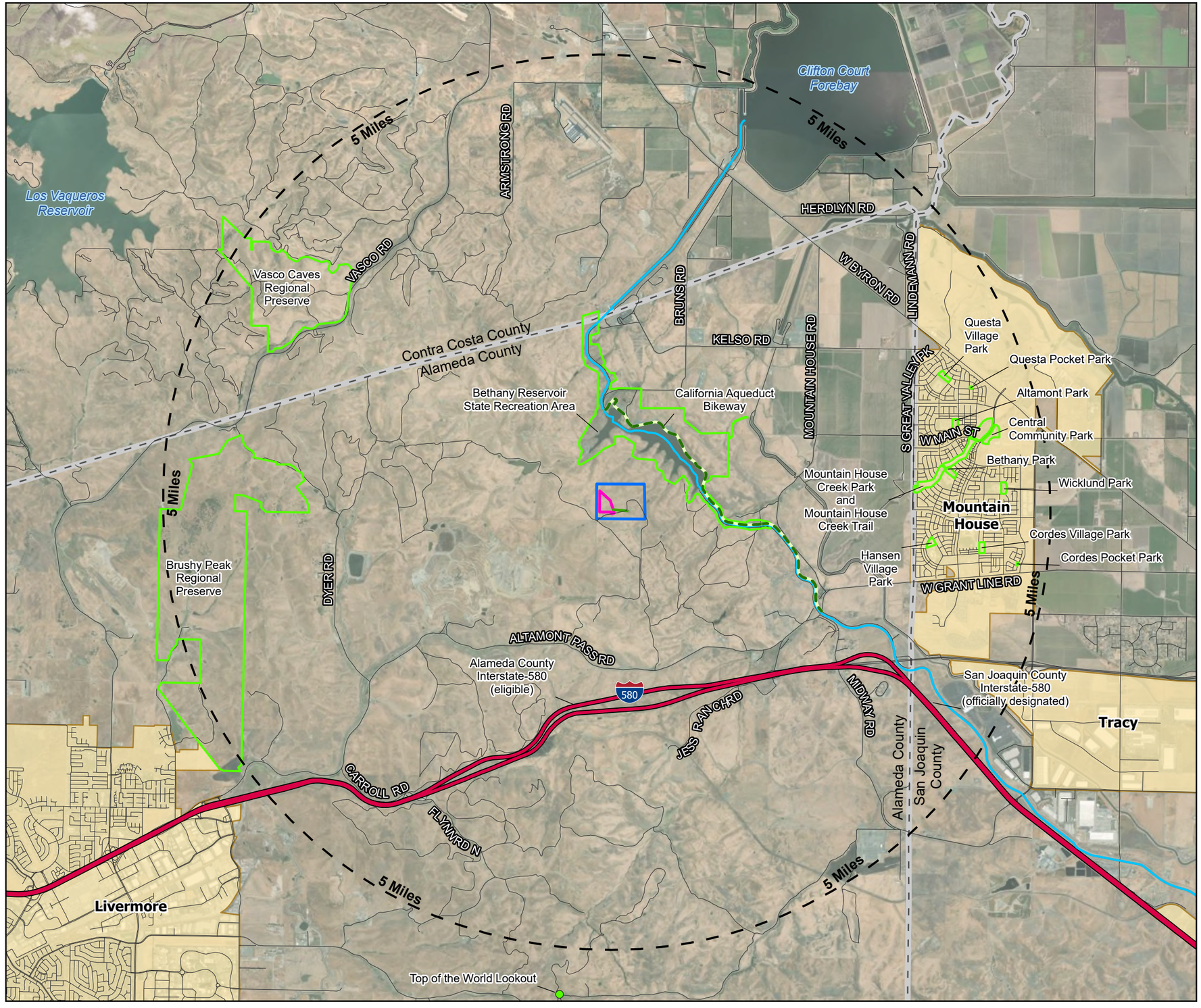
The Project is located within the Altamont Pass area of unincorporated Alameda County on a 443-acre privately owned parcel that is not publicly accessible (Alameda County 2010). The Altamont Pass area is located in the northern portion of the Diablo Range, which is part of the Southern Pacific Coast Ranges. The area has an average elevation of about 3,000 feet, rolling grasslands and plateaus, and is punctuated by isolated peaks of between 3,800 feet and 5,200 feet. The San Joaquin Valley and the city of Tracy are located to the east, while the Livermore Valley and the city of Livermore are located to the west. The Project is located approximately 4.7 miles northwest of the city of Tracy, approximately 0.8 mile southwest of the Bethany Reservoir State Recreation Area, approximately 1.8 miles north of Altamont Pass Road, and approximately 2 miles north of I-580. The Project is also located in the northeastern portion of the Altamont Pass Wind Resource Area, which encompasses approximately 49,202 acres and includes more than 50 conditional use permits for more than 400 operating wind turbines (Alameda County 2014, Alameda County 2025). The Project is accessible via an existing private access road connecting to Altamont Pass Road. See Figure 5.12-2.

The landscape around the Project is dominated by rolling grass-covered hills, energy-related facilities, and livestock grazing operations. The Project area vegetation consists of natural grasslands of similar colors and textures, with nearly no shrubs or trees. The rolling hills generally screen views of the Project site from publicly accessible viewpoints in the surrounding area. The nearby wind turbines are a dominant visual feature, with many wind turbines generally located south and west of the Project. Each turbine is several hundred feet tall and visible from much of the surrounding area. An electrical transmission corridor traverses the Project from northwest to southeast and connects to the existing Ralph Substation. The transmission line consists of several large lattice-type structures. Numerous wires connecting these structures cut across the sky. The scale and extent of the wind turbines, substation, and transmission towers and wires create a strikingly distinctive industrial character in an otherwise natural-appearing landscape.

Northeast of the Project is the Bethany Reservoir State Recreation Area; several energy-related facilities, such as the Bethany Compressor Station and Mariposa Energy Project; and the California Department of Water Resources Bank Pumping Plant. Southwest of the Project is the Waste Management Altamont Landfill and Resource Recovery Center. South of the Project is Altamont Pass Road, I-580, and a Union Pacific Railroad line. East of the Project are the Ralph Substation, scattered large-lot single family residential homes, and the northern extent of the California Aqueduct system. Numerous existing wind turbines are located throughout the area. Minimal safety and security lighting is associated with all the aforementioned land uses. The nearest permanent residence is located approximately 1.8 miles to the southeast. Views of the Project from this residence would be screened by intervening topography.

According to the Alameda County East County Area Plan, the Project's land use is designated as "large parcel agriculture," which restricts the type of land use development allowed in this area (Alameda County 1994).

The Project and surrounding area is not identified as a Dark Sky Place by the International Dark Sky Association (International Dark Sky Association 2025).



Legend

- Project Study Area
- Gen Tie
- Viracocha BESS Equipment Yard
- Project Radius
- County Boundary
- City Limit
- Road
- California Aqueduct

Scenic Resources

- Lookout
- Bikeway
- Interstate
- Park

Source:
1) ESRI Aerial Images

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Miles

Figure 5.13-1
Scenic Resources within 5 Miles
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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5.13.1.3 Project Site

Figure 1-4 is an annotated aerial photograph showing the Project, which is situated on approximately 17 acres of the larger 443-acre parcel, and its main elements. The Project is located in a relatively flat depressed area in between the rolling hills that is approximately 400 feet above mean sea level. Hilltops to the west and south range from 500 to 800 feet above mean sea level, while hilltops to the east and north range from 300 to 400 feet above mean sea level. Vegetation on the Project consists of natural grasslands, with nearly no shrubs or trees.

A GIS-based viewshed analysis was conducted using a digital elevation model of the Project area to generate the zone of visual influence, which identifies the area of potential Project visibility. The zone of visual influence suggests that views of the Project from surrounding areas are limited due to the rolling hills in the Altamont Pass area. Note the zone of visual influence does not account for curvature of the earth or surface elements such as vegetation or buildings that could block direct line-of-sight views. As seen on Figure 5.13-2, areas to the east and north would have the best opportunities to see the Project (gen-tie structures) as shown in purple.

Research conducted on the visibility of electric transmission facilities indicates that single 230-kilovolt (kV) monopole towers were determined likely to be visible to casual observers at the maximum observed distance of 3.5 miles (Sullivan et al. 2014). Therefore, the area of visual effect (AVE) for the Project is 3.5 miles and was used to identify potentially sensitive viewers, publicly available viewpoints, and the selection of key observation points (KOPs) for detailed simulations.

5.13.1.4 Construction Laydown Area

Laydown areas would be provided within the 17-acre Project site and would be relocated within the footprint as specific phases advance.

5.13.2 Environmental Analysis

5.13.2.1 Analysis Procedure and Methodology

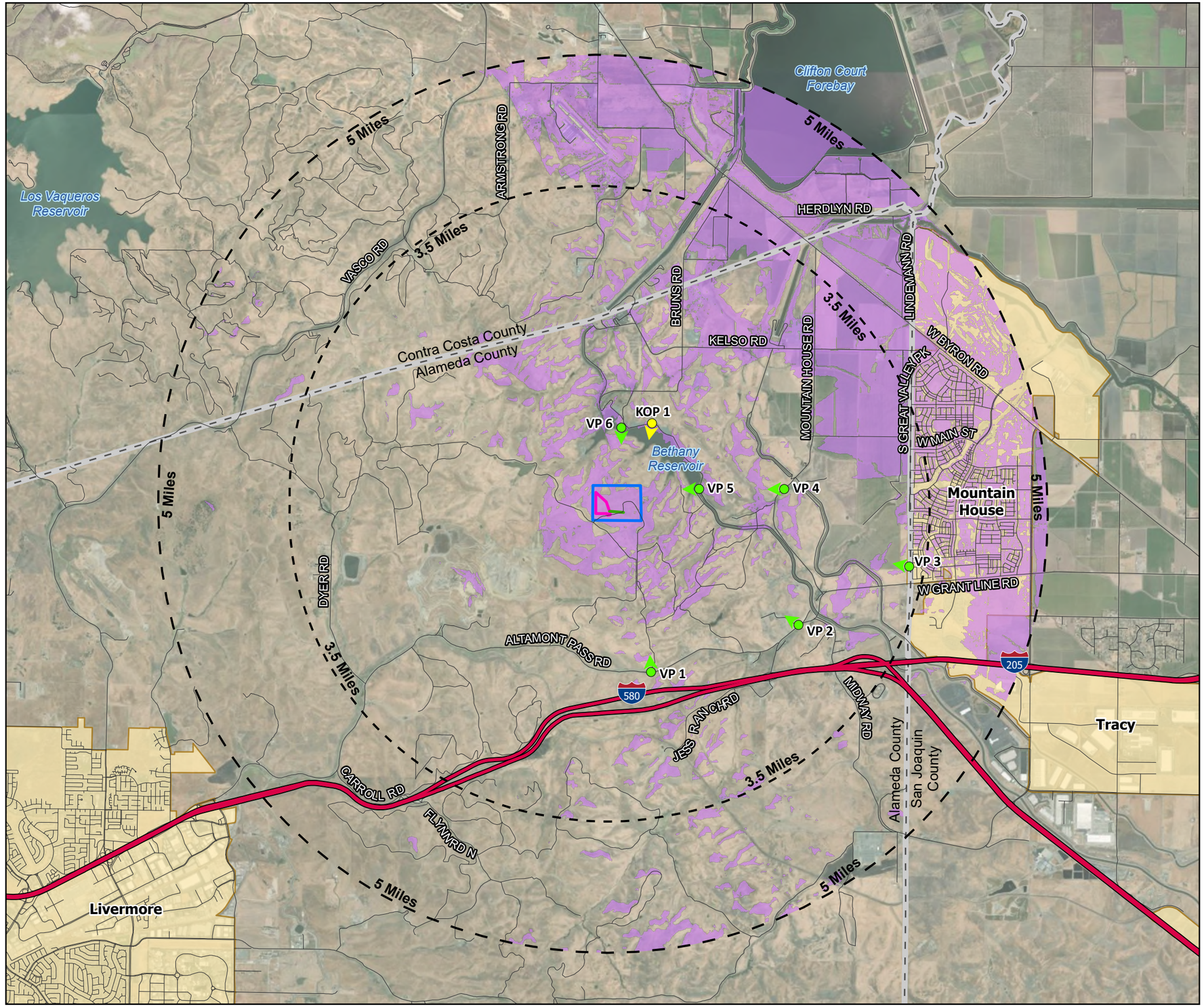
Regulatory Setting

A review of existing relevant LORS was conducted to identify (1) plans and policies relevant to visual character and quality that are potentially applicable to the Project and (2) any potential conflicts with these policies. This review is detailed in Section 5.13.5.

Photographic Survey

Field reconnaissance was conducted in January 2025 to observe and photograph existing visual conditions at the Project site and surrounding area. Photographs depicting views from potential KOPs and character photographs were taken using a digital single lens reflex camera set to take high-resolution pictures with a focal length equivalent to a 35-millimeter camera using a 50-millimeter lens. This type of equipment and setting best approximate perception of the human eye. A global positioning system (GPS) device was used to record the location from which each photograph was taken.

Because it is not feasible to analyze all potential viewing opportunities surrounding the Project, it was necessary to identify certain locations to represent the range of viewers and viewing conditions that would potentially be affected by the Project. Due to the limited number of publicly accessible locations from which the proposed Project would be visible, one KOP was selected for a visual simulation and detailed analysis. The KOP location was determined, in conjunction with CEC staff, based on public accessibility, existing land uses, and the potential for impacts on sensitive visual resources. Six other locations were selected to help describe the character of the surrounding area. Figure 5.13-2 depicts the location of the KOP and additional character photographs relative to the Project and surrounding area within the AVE.



Legend

- Key Observation Point (KOP)
- Viewpoint (VP)
- Project Study Area
- Gen Tie
- Viracocha BESS Equipment Yard
- Project Radius
- County Boundary
- City Limit
- Interstate
- Road
- Area of Potential Project Visibility

Source:
1) ESRI Aerial Images

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Figure 5.13-2
Area of Visual Effect
Viracocha Hill BESS Project
Alameda County, California

Jacobs

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Viewer Sensitivity

The range of potential viewers that may be affected by the Project can be described by the distinct types of viewers and the conditions they experience within the landscape. Understanding the types of viewers and their exposure to potential Project-related visual impacts helps to predict sensitivity and response to visual change in the landscape. Two types of viewers were identified in the Project area that could be potentially affected by the Project (FHWA 2015).

- Neighbors – consist of residential or commercial properties that are provided views to the Project and surrounding landscape. Neighbors generally have a higher sensitivity to visual change and a desire to maintain features of the existing landscape as it contributes to their quality of life (and existing visual experience). There are a limited number of neighbors within 3.5 miles of the Project, and a larger concentration of neighbors in the city of Mountain House within 5 miles of the Project to the east.
- Travelers – consist of motorists, bicyclists, pedestrians, or boaters/kayakers passing through the landscape that have views of the Project. By necessity, the driver of a motor vehicle focuses less on the view outside the vehicle while passengers are freer to view the adjacent landscape. Motorists move at higher speeds than other groups (bicyclists or pedestrians) and have temporary and/or intermittent viewing opportunities. Within the Project area, motorists on local roads include but are not limited to Altamont Pass Road, I-580, North Midway Road, West Grant Line Road, Mountain House Road, Great Valley Parkway, and Kelso Road to name just a few. Bicyclists and pedestrians could have more prolonged views of the Project due to their lower speeds. Within 3.5 miles of the Project, bicycle and pedestrian facilities include the Bethany Reservoir State Recreation Area, Bethany Creek Trail, and California Aqueduct Bikeway. Boaters/kayakers on Bethany Reservoir would also have prolonged views of the Project site due to their lower speeds.

A review of publicly available aerial imagery was conducted to identify concentrations of viewers within the AVE, particularly those in residential areas, recreation areas, and other places where sensitivity levels would be considered high. Viewer sensitivity is the outcome of viewer exposure and awareness (FHWA 2015).

- Viewer exposure considers:
  - Proximity—the viewer's distance from the visual change.
  - Extent—the number of people that would be exposed to the visual change.
  - Duration—the amount of time for which the viewer would see the Project.
- Viewer awareness considers:
  - Attention to the Project—degree to which the view is routine or unique; viewers are less sensitive to a routine view than a unique view.
  - Focus—the presence of one or more distinct focal points that draw viewers' attention.
  - Protection—formal or informal restrictions on changes to a visual resource, such as view protection ordinances.

Viewer sensitivity regarding exposure and awareness was evaluated on the following scale:

- Low sensitivity:
  - Few viewers would experience a view.
  - Potential views of the Project are screened or filtered by intervening terrain, buildings, or vegetation.
  - Viewers are not particularly concerned about the quality of views due to their activity type, such as driving.
- Moderate sensitivity:
  - The Project does not dominate views due to distance but is noticeable.
  - Viewer activity is not focused on visual quality, such as working in an office or field, or participating in an organized sporting event.

- High sensitivity:
  - The Project is highly prominent, open to view, and seen by a relatively high numbers of viewers.
  - Viewer concern and expectations of visual quality is high, as in a rural park where scenery is a primary focus, or in a residential neighborhood.

Potential sensitive viewpoints were selected within the AVE based on viewer types (such as residential neighbors), central gathering locations (such as parks or recreational centers), anticipated degree of visual change, and public access. Because much of the AVE is privately owned and right-of-entry to areas near the Project site was not always feasible, the viewpoint locations were limited to publicly available rights-of-way. Potential viewpoints were evaluated based on the following considerations:

- Topography or nearby land uses would completely obscure views of the Project site. Therefore, potential visual changes would not affect the existing setting.
- Topography or nearby land uses would partially obscure views of the Project site, resulting in narrow views or small glimpses. Therefore, potential visual changes would be minor and would not noticeably affect the existing setting.
- Topography or nearby land uses would not obscure views of the Project site, resulting in direct views of the Project site. Therefore, potential visual changes could noticeably affect the existing setting.

Based on this information, multiple viewpoints were identified as potentially representative of sensitive views of the Project.

Visual Character and Quality

Visual character is an impartial description of the visible attributes of a landscape using terms such as form (mass or bulk), line (horizontal or vertical), color (uniform or contrasting), and texture (smooth or coarse). Visual character descriptions include the underlying landform and landcover (water, trees, human developments). In some landscapes, certain human, natural, or cultural features can become focal points. The interrelationships of these elements can be described in terms of dominance, scale, diversity, and continuity (uninterrupted flow). Visual character also describes proximity of viewers in terms of distance zones (FHWA 2015):

- Foreground: 0.25-0.5 mile from viewer.
- Middle ground: From foreground to 3-5 miles from viewer.
- Background: From middle ground to limit of visibility.

Section 5.13.1.1 contains a description of the regional setting and scenic resources within 5 miles of the Project, Section 5.13.1.2 contains a description of the local setting around the Project, and Section 5.13.1.3 contains a description of the Project. In all three cases, the visual character consists of rolling grass-covered hills, energy-related facilities, and livestock grazing operations.

In general, visual quality is a measure of how viewers perceive the aesthetic or visual value of the landscape. Visual quality was assessed by applying the Bureau of Land Management's (BLM's) scenic quality rating process, which evaluates the landscape character to determine an overall visual quality rating using key factors (BLM 1984, BLM 1986a, BLM 1986b). Table 5.13-2 provides rating criteria and a numerical score associated with each.

Table 5.13-2. Visual Quality Inventory and Evaluation Chart

Key Factors	Rating Criteria and Scores		
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***

Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5

Source: BLM Form 8400-1, BLM 1986

This table was used to evaluate the visual quality for the KOP both before and after Project construction, as well as for the representative character photographs of the surrounding area. In some cases, a value between two ranges was used where results straddled the descriptions, such as "2" for landform.

Visual Impact Analysis and Simulations

The assessment of visual impacts evaluates the anticipated changes in contrast that would result from the Project (both positive and negative), the sensitivity of typical viewers to the change, and the resulting change to visual quality. The analysis is based on a simulation of the completed Project developed for the KOP and considers the following:

- Compatibility of the impact—the degree to which the Project contrasts with the existing visual and aesthetic environment:
  - None: The element contrast is not visible or perceived.
  - Weak: The element contrast can be seen but does not attract attention.
  - Moderate: The element contrast begins to attract attention and begins to dominate the characteristic landscape.
  - Strong: The element contrast demands attention, would not be overlooked, and is dominant in the landscape.
- Changes to visual quality—the degree to which visual quality would change based on compatibility of the Project with the aesthetic environment defined as low, moderately low, moderate, moderately high, or high.
- Viewer sensitivity of the impact—the degree to which viewer groups are exposed to and are aware of the changes to the visual environment, defined as low, moderate, or high.

The resulting degree of impact can be beneficial, adverse, or neutral. Beneficial impacts would improve the viewing experience and may enhance visual resources or create improved views of those resources. Adverse impacts would degrade the quality of the visual resources, obstruct sensitive views, or change desired views. Neutral impacts would result in no noticeable change.

Photographic visual simulations are spatially accurate and realistic images of views of the Project from KOPs. They depict how existing visual conditions from a KOP would change with the Project design. Visual simulations are key to assessing impacts and determining if the Project design would be consistent or inconsistent with applicable plans.

Using digital photographs of the existing visual conditions at the selected KOP, a visual simulation was prepared to depict the view from the KOP with the completed Project in place. Computer modeling and rendering techniques were used to produce the simulated image. First, existing topographic and site data were used as the basis for developing an initial digital site model. Then, engineering and design data for each Project component were used to create a three-dimensional (3D) digital model of the Project. The viewer location was identified in the 3D model with the same geographical coordinates from the recorded GPS data and adjusted 5 feet from the existing ground surface of the site model to approximate the assumed viewer eye level. The visible terrain and existing digital site model were then used to align the 3D model with the photograph as seen from the viewer location. Once the elements of the existing site model were aligned, the 3D model of the Project design was displayed at the correct scale and orientation. With the Project design correctly aligned, a computerized rendering was generated of the Project, resulting in a simulated view of the Project design merged with the photograph. Colors, patterns, and lighting were applied as needed to the rendering to give the Project components their final realistic appearance. Finally, graphics editing techniques were used to blend the rendering of the Project components into the photograph to create the completed visual simulation.

Comparison of the "before" photograph with the simulation of the Project as it would appear after construction provided the basis for determining Project impacts on views and visual quality. Existing and simulated photographs are provided in Tables 5.13-11 and 5.13-12.

Lighting Analysis

The assessment of the existing nighttime visual character is based on the current perceived and actual lighting conditions in the existing landscape. To establish a baseline of pre-Project lighting conditions, existing sources of nighttime lighting were documented during desktop-level review of the landscape and during photographic field investigations. Levels of perceived skyglow are based on understanding of existing light sources in the landscape and, primarily, those associated with residential and commercial land uses and transportation corridors located near the Project. Lighting conditions in the Project landscape were documented qualitatively. No quantitative measurement of light or skyglow levels occurred during preparation of the lighting assessment.

Lighting conditions were evaluated qualitatively and were classified based on definitions and descriptions from established international lighting guidelines, which consist of a set of established environmental lighting zones for classifying exterior light levels (CIE 2017). Environmental lighting zones and related quantitative thresholds are shown in Table 5.13-3.

Table 5.13-3. Environmental Lighting Zone Classifications

Zone	Lighting Environment	Examples of Lighting Conditions
E0	Intrinsically Dark	UNESCO Starlight Reserves, International Dark Sky Association Dark Sky Parks, major optical observatories
E1	Dark	Relatively uninhabited rural areas
E2	Low District Brightness	Sparsely inhabited rural area
E3	Medium District Brightness	Well inhabited rural and urban settlements
E4	High District Brightness	Town and city centers and other commercial areas

Source: CIE 2017

The assessment of Project-related lighting involved a review of available lighting information for the Project. Where limited or no detail regarding Project lighting was available, assumptions concerning general layout and illumination levels required for safe operations were made based on experience with similar BESS facilities and related assessments. This information provided an estimate of the potential incremental increase in lighting that may result from the Project and was considered in a qualitative assessment as to whether anticipated light levels with the Project would exceed thresholds for environmental lighting zone classifications and result in the local area being classified as a less restrictive environmental lighting zone. For the purpose of this analysis and based on the description of environmental lighting zones, the Project area is within the E2 environmental lighting zone. A change in an environmental lighting zone classification would signal a noticeable change in the perceived lighting conditions experienced by viewers during the nighttime.

Consistency Analysis

Consistent with CEC guidelines and in accordance with CEQA Guidelines Appendix G Environmental Checklist Form, an analysis of consistency between the Project and applicable General Plan policies and standards is required and is presented in Section 5.13.2.4.

5.13.2.2 Project Appearance

This section provides an overview of the visual components of the Project, including structures, dimensions, and materials; construction staging; lighting, perimeter fence and landscaping; and post-Project decommissioning.

Project Structures, Dimensions, and Materials

The primary Project components are described in Section 2. A visual simulation of the Project appearance from one vantage point is shown in Figure 1-3, while Figure 2-1 depicts the site plan and general layout of the Project components, including fencing. Table 5.13-4 identifies the aesthetic characteristics of the primary Project components with emphasis on dimensions, materials, and finishes.

Table 5.13-4. Characteristics of Primary Project Components

Component	Dimensions/Size	Materials	Finishes
Up to 144 Battery Units (Tesla Megapack 2XL or similar)	28.88 feet long × 5.42 feet wide × 9.17 feet high each	Prefabricated metal material	Light to dark gray
Up to 36 Medium Voltage Transformers	10.0 feet long × 11.0 feet wide × 8.0 feet high each	Prefabricated metal material	Light to dark gray
One 260 Horsepower Emergency Diesel Fire Water Generator	16.0 feet long × 10.0 feet wide × 10.0 feet high	Prefabricated metal material	Light to dark gray
One 28,000 Gallon Emergency Fire Water Pump Tank	16.0 feet high × 17.0 feet diameter	Prefabricated metal material	Light to dark gray
One 1,000 Horsepower Standby Emergency Diesel Generator	16.0 feet long × 10.0 feet wide × 10.0 feet high	Prefabricated metal material	Light to dark gray
Operations and Maintenance Pad	50 feet long x 50 feet wide	Gravel	Light to dark gray
Onsite Substation (includes main power transformer, medium voltage switches and/or breakers, high-voltage switches and/or breakers, current transformers and voltage transformers, metering devices, control room, medium voltage and high-voltage conductors, steel structures, dead-end arrestor)	Varies: tallest component (dead-end arrestor) would be 75.0 feet high	Prefabricated metal material	Light to dark gray
Gen-tie line with three 230-kV monopole towers	125.0 feet high	Prefabricated metal material	Light to dark gray
Security Fence	8.0 feet tall	Chain link with three strands of barbed wire	Light to dark gray

Other Project components include a minor amount of access road improvements. Of these Project components, the single steel pole structures (or monopoles) would be the most visible in the surrounding area due to their height (approximately 125 feet tall) and the relatively low profile of the remaining elements.

Finishes for materials and surface treatments would be predominantly flat and non-reflective to minimize the potential for glare. The Project would be surrounded by an 8-foot-tall chain link fence with primary site access via a restricted gate on the east side of the facility (one internal gate would be installed to control access to the substation area).

Construction Staging Area

Staging areas would be provided within the footprint of the Project and would be relocated within the footprint as specific phases advance. The following activities and equipment would be visible during construction:

- Although the Project is relatively level, grading would be required; soil would be balanced onsite and not require import or export of material.
- Vegetation root mass would generally be left in place, but removed to accommodate the following:
  - gravel roads,
  - placement of fill from grading operations,
  - battery enclosures,
  - excavations for underground utilities (if necessary), and
  - gen-tie poles.
- Construction equipment would include scrapers, graders, water trucks, dozers, compaction equipment, cranes, boom trucks, forklifts, rubber-tired loaders, rubber-tired backhoes, and other small- to medium-sized construction equipment.
- Material and supplies would be delivered via I-580, West Grant Line Road, and Altamont Pass Road.
- Temporary construction staging areas would be used for construction trailers, employee parking, laydown, staging, and storage of construction materials.
- Staging areas would be located within the 17-acre Project; no staging areas are located outside of the Project area.
- Erosion control measures, such as silt fences and straw bales, may be installed.
- Disturbed areas would be reseeded and restored to pre-Project conditions following construction.

Lighting

- Nighttime construction may be required for certain activities, but the majority of construction work would occur during daylight hours (7:00 a.m. to 5:00 p.m., Monday through Friday). If nighttime construction activity is required, all necessary temporary lighting would be directed onto work areas and away from sensitive receptors such as nearby residences and habitat.
- Permanent motion-sensitive, directional security lights would be installed to provide adequate illumination around the Project and points of ingress/egress. All lighting would be shielded and directed downward to minimize the potential for glare, spillover onto adjacent properties, and skyglow. Levels of individual lighting sources would comply with recommendations of the Illuminating Engineering Society, CEC, and Alameda County to ensure lighting is no brighter than necessary.
- Numerous motion-sensing and downward-directed light fixtures would be installed atop poles to provide adequate illumination of the offsite access road, the internal Project access roads, and the substation. Low-elevation (less than 14-foot), controlled security lighting would only be installed where required for safety, security, or operations, and would switch on only when personnel enter the area.
- Because the Project proposes minimal downward facing lighting with sensor activation along access roads and throughout the site, no change in the lighting zone classification is anticipated.

Perimeter Fence and Landscaping

- A permanent 8-foot-tall perimeter chain link fence would be constructed and would provide limited screening of the Project components.

Post-Project Decommissioning

The following activities would occur upon the end of the Project's lifespan:

- All Project components would be removed and where feasible recycled at an offsite location. Any non-recyclable components will be disposed of at an appropriately licensed waste disposal facility.
- Upon removal of Project components, the site would be restored in accordance with a County-approved decommissioning plan and would likely resemble pre-Project conditions.

5.13.2.3 Assessment of Visual Impacts

This section provides an assessment of the visual character and quality of the surrounding area from public rights-of-way (Viewpoint 1 through Viewpoint 6), and from the Bethany Reservoir State Recreation Area (KOP-1). It also discusses general lighting effects and post-Project decommissioning.

Public Views

Six publicly accessible locations were chosen to take representative character photographs of the area outside of the Project and are shown on Figure 5.13-2. Detailed explanations of Viewpoint 1 through Viewpoint 6 are provided in this section. Based on the topography of the rolling hills where the Project is located, views from Viewpoint 1, Viewpoint 2, Viewpoint 3, Viewpoint 4, and Viewpoint 6 are completely screened. Therefore, potential visual changes would not affect existing character or quality at these locations, and viewer sensitivity regarding exposure and awareness would be low. Topography would partially screen views of the Project at Viewpoint 5, resulting in narrow views or small glimpses. Therefore, potential visual changes would be minor and would not noticeably affect the existing character or quality at this location, and viewer sensitivity regarding exposure and awareness would also be low.

Viewpoint 1 is located approximately 1.8 miles south of the Project site and represents what travelers along Altamont Pass Road would see when looking north/northwest toward the Project. The foreground consists of a green grass-covered hill and a gray asphalt-gravel rock access road. No shrubs or trees are visible from this viewpoint. Visible horizontal and vertical lines are associated with a security fence on the bottom of the view, while the bright blue sky is located on the top of the view. The landscape is primarily natural, as built features are limited to the roadway and fence structures in the foreground. The Project is hidden by the hillside. As indicated in Table 5.13-5, the visual quality rating at Viewpoint 1 is low.

Table 5.13-5. Viewpoint 1 Quality Rating

Existing View Looking North/Northwest from Altamont Pass Road


Key Factors		Rating Criteria and Scores		Rating
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**1**

Key Factors		Rating Criteria and Scores		Rating
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**0**
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**1**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**0**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**1**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**0**
Total Score				**5, Low**

Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5

Source: BLM Form 8400-1, BLM 1986

Viewpoint 2 is located approximately 2.5 miles southeast of the Project and represents what travelers along West Grant Line Road and a few isolated residential neighbors would see when looking northwest toward the Project. The foreground consists of green, grass-covered hill, a small horizontal band of exposed brown dirt, a gray gravel rock access road, a light brown/gray single family residence, tan barn/storage shed, and multiple types of fencing (green access gate, white wood, and gray barbed wire). Limited shrubs are visible from this viewpoint. Several rounded and vertically formed trees, of varying colors and foliage density, are visible and protrude into the skyline. Visible horizontal and vertical lines are associated with the private property fencing on the bottom and middle portions of the view, while the bright blue sky is located on the top of the view. The lines associated with the residence and barn/storage shed are located in the middle portion of the view on top of the hillside and offer a small degree of contrast. The vertical brown utility pole is highly noticeable on the right side of the view, while a horizontal overhead powerline is visible above the skyline. Overhead horizontal utility lines are also visible on the upper right portion of the view. The landscape is a mix of both natural and built features, with the built features not forming a distinct pattern. The Project is hidden by the hillside. As indicated in Table 5.13-6, the visual quality rating at Viewpoint 2 is moderately low.

Table 5.13-6. Viewpoint 2 Quality Rating

Existing View Looking Northwest from West Grant Line Road				
				
Key Factors		**Rating Criteria and Scores**		**Rating**
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**1**

Key Factors		Rating Criteria and Scores		Rating
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**0**
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**0**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**1**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**0**
Total Score				**6, Moderately Low**

Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5

Source: BLM Form 8400-1, BLM 1986

Viewpoint 3 is located approximately 3.5 miles east of the Project and represents what travelers along Great Valley Parkway and neighbors from the boundary of the Hansen Subdivision in the city of Mountain House would see when looking west toward the Project. The foreground consists of a row of symmetrically planted trees (green in the spring/summer months and brown in the fall/winter months) protruding into the skyline, a brown wood fence, and an agricultural field. In the middle ground, several high-voltage transmission towers with overhead utility lines are visible on the horizon. The black asphalt of Great Valley Parkway on the bottom of the view provides a high contrast with the agricultural field in the middle of the view and the bright blue sky is located on the top of the view. No shrubs or trees are visible, from this viewpoint, in the agricultural field. Highly noticeable horizontal lines are associated with the road and fence in the bottom of the view, while the trees and black streetlight are noticeable vertical lines in the

middle of the view. The landscape is a mix of both natural and built features, with the built features forming a distinct pattern. The Project is screened by intervening topography. As indicated in Table 5.13-7, the visual quality rating at Viewpoint 3 is moderately low.

Table 5.13-7. Viewpoint 3 Quality Rating

Existing View Looking West from Great Valley Parkway in Front of Hansen Subdivision

Key Factors		Rating Criteria and Scores		Rating
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**1**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**2**

Key Factors		Rating Criteria and Scores		Rating
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**0**
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**0**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**1**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**0**
Total Score				**6, Moderately Low**

Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5

Source: BLM Form 8400-1, BLM 1986

Viewpoint 4 is located approximately 2 miles east of the Project and represents what travelers along Mountain House Road would see when looking west/southwest toward the Project. The foreground consists of a green grass-covered hill and a gray asphalt road. No shrubs or trees are visible from this viewpoint. Visible horizontal and vertical lines are associated with a property fence on the bottom of the view, an overhead powerline following the roadway, and the bright blue sky is located on the top of the view. Several mailboxes are located in the bottom left corner of the view. The landscape is primarily natural, with very few built features present. The Project is hidden by the hillside. As indicated in Table 5.13-8, the visual quality rating at Viewpoint 4 is moderately low.

Table 5.13-8. Viewpoint 4 Quality Rating

Existing View Looking West/Southwest from Mountain House Road				
				
Key Factors		**Rating Criteria and Scores**		**Rating**
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**1**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**0**

Key Factors		Rating Criteria and Scores		Rating
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**1**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**1**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**0**
Total Score				**7, Moderately Low**

Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5

Source: BLM Form 8400-1, BLM 1986

Viewpoint 5 is located approximately 1 mile east of the Project and represents what travelers along California Aqueduct Bikeway would see when looking west/southwest toward the Project. The foreground consists of security fencing, Bethany Reservoir, and multiple green grass-covered hills. In the middle ground, several energy-related facilities (wind turbines and high-voltage transmission towers with overhead utility lines) are visible on the horizon. No shrubs or trees are visible from this viewpoint. Visible horizontal and vertical lines are associated with the security fencing around Bethany Reservoir on the bottom of the view, while the bright blue sky is located on the top of the view. Visible vertical elements are also associated with the wind turbines/ transmission towers in the middle portion of the view. One black/white informational sign is visible on the security fence. The landscape is primarily natural, but there are highly noticeable built features present (fencing and wind turbines). The Project is partially hidden by the rolling hills. As indicated in Table 5.13-9, the visual quality rating at Viewpoint 5 is moderately low.

Table 5.13-9. Viewpoint 5 Quality Rating

Existing View Looking West/Southwest from California Aqueduct Bikeway at Bethany State Recreation Area				
				
Key Factors		**Rating Criteria and Scores**		**Rating**
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**1**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**2**

Key Factors		Rating Criteria and Scores		Rating
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**1**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**2**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**-2**
Total Score				**8, Moderately Low**
Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5				
Source: BLM Form 8400-1, BLM 1986				

Viewpoint 6 is located approximately 1 mile north of the Project and represents what visitors would see when looking south from the Bethany State Recreation Area toward the Project. The foreground consists of Bethany Reservoir and multiple green grass-covered hills. In the middle ground, several energy-related facilities (wind turbines and high-voltage transmission towers with overhead utility lines) are visible on the horizon on the right-middle portion of the view. Only a few shrubs and trees are visible from this viewpoint. Visible horizontal lines are associated with the shoreline of Bethany Reservoir on the bottom of the view, while the bright blue sky is located on the top of the view. The landscape is primarily natural, with no built features present. The Project is hidden by the rolling hills. As indicated in Table 5.13-10, the visual quality rating at Viewpoint 6 is moderately low.

Table 5.13-10. Viewpoint 6 Quality Rating

Existing View Looking South from the Public Parking Lot at Bethany State Recreation Area


Key Factors		Rating Criteria and Scores		Rating
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**1**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**2**

Key Factors		Rating Criteria and Scores		Rating
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**0**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**1**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**0**
Total Score				**8, Moderately Low**
Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5				
Source: BLM Form 8400-1, BLM 1986				

KOP 1 — View from Bethany Reservoir State Recreation Area

One KOP was selected, in conjunction with CEC staff, based on public accessibility, existing land uses, and the potential for impacts on sensitive visual resources which are shown on Figure 5.13-2. KOP-1 is located approximately 1.1 miles north of the Project and represents what travelers along California Aqueduct Bikeway would see when looking south toward the Project. The foreground consists of Bethany Reservoir and multiple green grass-covered hills. In the middle ground, several energy-related facilities (wind turbines and high-voltage transmission towers with overhead utility lines) are visible on the horizon, protruding into the skyline. Several green shrubs and trees are visible from this viewpoint along the shoreline of Bethany Reservoir in the middle left portion of the view. Visible vertical elements are associated with the wind turbines/transmission towers in the middle portion of the view, while the bright blue sky with scattered white clouds is located on the top of the view. The landscape is primarily natural, but there are highly noticeable built features present (wind turbines). The Project is partially screened by the rolling hills. As indicated in Table 5.13-11, the visual quality rating at KOP-1 is moderately high (also see Figure 5.13-3a).

Table 5.13-11. KOP-1 Quality Rating Without Project

Existing View Looking South from California Aqueduct Bikeway at Bethany Reservoir State Recreation Area


Key Factors		Rating Criteria and Scores		Rating
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**2**

Key Factors		Rating Criteria and Scores		Rating
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**4**
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**3**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**3**
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**1**
Total Score				**17, Moderately High**

Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5

Source: BLM Form 8400-1, BLM 1986

Collectively, the new battery units, voltage transformers, gen-tie structures, fire water tank, and onsite substation would be the most prominent features at the Project site. The different components at the Project provide for relief and a textured appearance. The cluster of battery units generally repeat in form, color, and texture. Together, these components would appear as a new rectangular shaped horizontal form of light to dark gray color interrupting an expanse of green rolling grass-covered hills. As detailed in Table 5.13-4, most of the Project components are less than 10 feet high, except for the fire water tank at 16 feet high, dead-end arrestor at 75 feet high, and the gen-tie line at 125 feet high. Table 5.13-12 shows a visual simulation of the Project at KOP-1 with the Project in place (also see Figure 5.13-3b). Due to the topography of the rolling hills, only the upper portion of one of the three gen-tie line poles and associated overhead utility lines would be visible from KOP-1, as the Project resides in a relatively flat depressed area in between the rolling hills. This gen-tie pole is visible in the middle portion of the view, and just to the right of the two existing high-voltage transmission towers. This one gen-tie pole is visually absorbed by the existing energy-related facilities located either in front of or behind the Project. Additionally, its light color against the horizon makes it nearly indiscernible. The overhead utility lines are also barely distinguishable against the sky and appear to be part of the existing energy-related facilities. Views in the foreground are unaffected by the Project. The Project is located in the middle ground in this visual simulation and is difficult to distinguish.

For these reasons, the visual character remains primarily unchanged, as does visual quality because the contrast created by the visible Project elements are not readily perceived. The potential visual changes would be minor and would not noticeably affect the existing character, and viewer sensitivity regarding exposure and awareness would be low. Visual quality would remain moderately high. Therefore, the Project is considered to be compatible with existing environment and long-term visual impacts would be neutral.

Table 5.13-12. KOP-1 Quality Rating with Project

Proposed View Looking South from California Aqueduct Bikeway at Bethany Reservoir State Recreation Area (see red circle for new visible Project component)

Key Factors		Rating Criteria and Scores		Rating
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. ***Score 5***	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features that are interesting though not dominant or exceptional. ***Score 3***	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. ***Score 1***	**2**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. ***Score 5***	Some variety of vegetation, but only one or two major types. ***Score 3***	Little or no variety or contrast in vegetation. ***Score 1***	**2**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. ***Score 5***	Flowing, or still, but not dominant in the landscape. ***Score 3***	Absent, or present, but not noticeable. ***Score 0***.	**4**
Color	Rich color combinations, variety, or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snowfields. ***Score 5***	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. ***Score 3***	Subtle color variations, contrast, or interest; generally mute tones. ***Score 1***	**2**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. ***Score 5***	Adjacent scenery moderately enhances overall visual quality. ***Score 3***	Adjacent scenery has little or no influence on overall visual quality. ***Score 0***	**3**
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ***Score 5***	Distinctive, though somewhat similar to others within the region. ***Score 3***	Interesting within its setting, but fairly common within the region. ***Score 1***	**3**

Key Factors		Rating Criteria and Scores		Rating
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. ***Score 2***	Modifications add little or no visual variety to the area and introduce no discordant elements. ***Score 0***	Modifications add variety but are very discordant and promote strong disharmony. ***Score -4***	**1**
Total Score				**17, Moderately High**
Visual Quality Scoring – High = 20+, Moderately High = 16-19, Moderate = 11-15, Moderately Low = 6-10, or Low = 1-5				
Source: BLM Form 8400-1, BLM 1986				

Lighting Effects

The limited, infrequent nature of nighttime lighting, if required during Project construction, would be temporary and short-term, and is not expected to substantially affect nighttime viewing. Although lighting is required during Project operations and would create new sources of light, lighting from the Project during operations would be shielded and directed downward, activated by motion sensors, and would be considered a minor contributor to light levels. Therefore, the Project is not anticipated to change the overall nighttime light environment.

Post-Project Decommissioning

Upon decommissioning and removal of Project components, the site would be restored and would closely resemble pre-Project conditions.

5.13.2.4 Analysis of Policy Consistency

Pursuant to CEC Application Requirements and Appendix G of the CEQA Guidelines, there are two pathways for preparing an assessment of potential impacts on visual resources. Specifically, the CEC Application Requirements and Appendix G of the CEQA Guidelines state the following with regard to assessing impacts on visual character:

> "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 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?"

CEQA defines an "urbanized area" as an incorporated area that has a population of at least 100,000 persons, either by itself or by adding the population of the city with no more than two contiguous incorporated cities (Public Resources Code Section 21071(a)(1) – (2)). Since the Project is located in unincorporated Alameda County, a degradation analysis of existing visual character and quality of public views of the site and the surrounding area was conducted. As described in Section 5.13.2.3, the Project was found to be compatible with existing environment, and long-term visual impacts would be neutral.

Table 5.13-13 details the Project's conformity with policies and standards governing aesthetic or visual quality. Implementation of the Project by the applicant would not conflict with an applicable regulation governing aesthetic or visual quality.

Table 5.13-13. Project Conformity with Regulations Governing Aesthetic or Visual Quality

Goal/Policy	Project Consistency
CEQA Appendix G	
Would the project have a substantial adverse effect on a scenic vista?	***Consistent.*** No scenic resources are located at the Project site, and it has been located to minimize views from scenic resources within 5 miles.
Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway?	***Consistent.*** No scenic resources are located at the Project site, and it has been located to minimize views from scenic resources within 5 miles.
Would the project substantially degrade the existing visual character or quality of the site and its surroundings?	***Consistent.*** The visual character remains primarily unchanged, as does visual quality because the contrast created by the visible Project elements are not readily perceived. The potential visual changes would be minor and would not noticeably affect the existing character, and viewer sensitivity regarding exposure and awareness would be low. Visual quality would remain moderately high.
Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	***Consistent.*** While lighting is required during Project operations and would create new sources of light, lighting from the Project during operations would be a minor contributor to light levels and is not anticipated to change the overall nighttime light environment.
California Department of Transportation (Caltrans) State Scenic Highways	
Officially Designated State Scenic Highway – officially designated roadways are part of the Scenic Highway System and care must be taken to preserve its official status.	***Consistent.*** Travelers on I-580 in San Joaquin County would be very unlikely to see the Project as it is approximately 3.5 to 5 miles southeast. Based on the area of potential Project visibility, the topography or nearby land uses would completely screen views of the Project site. See **Figure 5.13-1**.
Eligible State Scenic Highway – if a highway is listed as eligible for official designation, it is also part of the Scenic Highway System and care must be taken to preserve its eligible status.	***Consistent.*** Travelers on I-580 in Alameda County would be very unlikely to see the Project even though the highway is approximately 2 miles south. Based on the area of potential Project visibility, the topography or nearby land uses would completely screen views of the Project site. See **Figure 5.13-1**.
Alameda County East County Area Plan (1994)	
Policy 108 – Structures shall be located…where the development is least visible to persons on public roads, trails, parks, and other public viewpoints.	***Consistent.*** Due to the topography of the rolling hills, only one of the three the gen-tie line poles and associated overhead utility lines would be visible as the Project site resides in a relatively flat depressed area in between the rolling hills.

Goal/Policy	Project Consistency
Policy 114 – The County shall require the use of landscaping to enhance the scenic quality of the area and to screen undesirable views. Choice of plants should be based on compatibility with surrounding vegetation, drought-tolerance, suitability to site conditions; and habitat value and fire retardance.	***Consistent.*** Disturbed areas will be replanted based on Policy 114 requirements and in conformance with any landscape guidelines prepared by Alameda County under Program 53.
Policy 115 – Appropriate building materials, landscaping, and screening shall be required to minimize the visual impact of development. Development shall blend with, and be subordinate to, the environment and character of the area so as to be as unobtrusive as possible and not detract from the natural, open space, or visual qualities of the area. To the maximum extent practicable, all exterior lighting must be located, designed, and shielded so as to confine direct rays to the parcel where the lighting is located.	***Consistent.*** The 8-foot high chain link fence would provide screening of the Project components. Lighting would be shielded and directed downward and would only switch on when personnel enter the area, confining direct rays to the Project site.
Policy 116 – Development shall be located and designed to conform with, rather than change, natural landforms. The alteration of natural topography, vegetation, and other characteristics by grading, excavating, filling, or other development activity shall be minimized. Access roads shall be consolidated and located where they are least visible from public viewpoints.	***Consistent.*** A minimal amount of grading would be required, particularly given the mostly flat topography of the Project site. Grading will conform with any grading guidelines prepared by Alameda County under Program 54. No to minimal fill material is anticipated. Few access roads will be necessary and will be located where they are least visible from public viewpoints.
Policy 117 – Where grading is necessary, the offsite visibility of cut-and-fill slopes and drainage improvements shall be minimized. Graded slopes shall be designed to simulate natural contours and support vegetation to blend with surrounding undisturbed slopes.	***Consistent.*** See Policy 116.
Policy 119 – The County shall require that access roads be sited and designed to minimize grading.	***Consistent.*** See Policy 116.
Policy 120 – The County shall require that utility lines be placed underground whenever feasible. When located above ground, utility lines and supporting structures shall be sited to minimize their visual impact.	***Consistent.*** The Project includes an option to place utility lines underground. If not feasible, overhead lines have been sited to minimize their visual impact. Use of monopoles rather than lattice towers would further minimize the visual impact of the transmission towers.
Program 53 – The County shall establish landscape guidelines for both urban and rural development, including a list of extremely invasive non-native plants not suitable for use in landscaping.	***Consistent.*** See Policy 115.
Program 54 – The County shall establish grading guidelines for the development of structures and access roads.	***Consistent.*** See Policy 116.

5.13.3 Cumulative Effects

CEQA Guidelines Section 15355 defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." The assessment of cumulative effects measures and describes the effects of adding the incremental changes from the Project to the effects of past projects and the predicted incremental change of current planned projects and proposed future projects. See Section 2.5 for a detailed analysis. There are nine energy projects, one residential project, one industrial project, and one transportation project nearby in Alameda County. There are six residential projects, one commercial project, and two transportation projects nearby in San Joaquin County. There is one nearby commercial project in Contra Costa County. All of these projects are in various states of approval and are shown on Figure 2-9.

The landscape in the region surrounding the Project demonstrates evidence of past and present visible disturbances related to agriculture, energy-related facilities, and residential and commercial development. Based on the severity of change depicted in the visual simulation, Project effects are not anticipated to substantially degrade existing visual character or quality, and there are no known planned or proposed future projects within the local viewshed that would create cumulative visual impacts in combination with the Project. As a result, the Project would not cause significant cumulative effects to visual resources.

5.13.4 Mitigation Measures

The Project would not result in a significant impact on visual resources. Therefore, no mitigation is required.

5.13.5 Laws, Ordinances, Regulations, and Standards

5.13.5.1 Federal Regulations

The Project would be constructed on private land, and no federal nexus (that is, no federal funding, no U.S. Department of Energy interconnection, or no federal personnel) would apply. Therefore, no federal regulations pertain to this Project.

5.13.5.2 State Regulations

California Environmental Quality Act

CEQA "is intended to inform government decisionmakers and the public about the potential environmental effects of proposed activities and to prevent significant, avoidable environmental damage" (State of California 2025). Appendix G of the CEQA guidelines includes an environmental checklist to determine the level of significance of potential impacts to affected resources, including aesthetics (CAEP 2024).

State Scenic Highways

Caltrans manages the State Scenic Highway Program. Caltrans defines scenic corridors as routes that "possess highly scenic and natural features, as viewed from the highway." Caltrans identifies I-580 in Alameda County south of the Project area from San Leandro to the I-205 interchange as an "eligible" State Scenic Highway, and I-580 in San Joaquin County south of the I-205 interchange to Highway 152 as an "officially designated" State Scenic Highway (see Figure 5.13-1). An eligible state highway becomes officially designated after the local governing body (county or city) applies to Caltrans for Scenic Highway approval, adopts a Corridor Protection Program, and receives notification of official designation (Caltrans 2018). Although no specific reasons for the I-580 designations were readily accessible, Alameda County defines scenic freeways as those that traverse or access "major, scenic, recreational, or cultural attractions" (Alameda County 1966). San Joaquin County bases scenic route designation on the following

criteria: leads to a recreational area; provides a representative sampling of the scenic diversity within the county; exhibits unusual natural or human-made features of interest; provides opportunities to view activities outside the normal routine of most people; provides a route for people to view the Delta waterways; and links two scenic routes or connects with scenic routes of cities or other counties (San Joaquin County 2016).

5.13.5.3 Local Requirements

Alameda County

Alameda County's East County Area Plan includes a goal to "preserve unique visual resources and protect sensitive viewsheds." Sensitive viewsheds are defined as "natural areas that provide orientation and a sense of place within a community or region. These areas typically include ridgelines, hilltops, large contiguous open space areas, and woodlands" (Alameda County 1994). The plan further identifies policies related to sensitive viewsheds. Many of these policies apply to specific ridgelines, peaks, open spaces, and large stands of mature trees. This Project would not be located on or within view of such features. The remaining policies that are potentially applicable to this Project are summarized as follows (Alameda County 1994):

- Policy 108: Structures shall be located…where the development is least visible to persons on public roads, trails, parks, and other public viewpoints.
- Policy 114: The County shall require the use of landscaping to enhance the scenic quality of the area and to screen undesirable views. Choice of plants should be based on compatibility with surrounding vegetation, drought-tolerance, suitability to site conditions; and habitat value and fire retardance.
- Policy 115: Appropriate building materials, landscaping, and screening shall be required to minimize the visual impact of development. Development shall blend with, and be subordinate to, the environment and character of the area so as to be as unobtrusive as possible and not detract from the natural, open space, or visual qualities of the area. To the maximum extent practicable, all exterior lighting must be located, designed, and shielded so as to confine direct rays to the parcel where the lighting is located.
- Policy 116: Development shall be located and designed to conform with, rather than change, natural landforms. The alteration of natural topography, vegetation, and other characteristics by grading, excavating, filling, or other development activity shall be minimized. Access roads shall be consolidated and located where they are least visible from public viewpoints.
- Policy 117: Where grading is necessary, the offsite visibility of cut-and-fill slopes and drainage improvements shall be minimized. Graded slopes shall be designed to simulate natural contours and support vegetation to blend with surrounding undisturbed slopes.
- Policy 119: The County shall require that access roads be sited and designed to minimize grading.
- Policy 120: The County shall require that utility lines be placed underground whenever feasible. When located above ground, utility lines and supporting structures shall be sited to minimize their visual impact.

The East County Area Plan also identifies implementation programs. Those that potentially apply include (Alameda County 1994):

- Program 53: The County shall establish landscape guidelines for both urban and rural development, including a list of extremely invasive non-native plants not suitable for use in landscaping.
- Program 54: The County shall establish grading guidelines for the development of structures and access roads.

Existing view looking south from California Aqueduct Bikeway at Bethany Reservoir State Recreation Area.

Figure 5.13-3a
KOP 1 - Existing Condition
Viracocha Hill BESS Project
Alameda County, California

Jacobs

Simulated view looking south from California Aqueduct Bikeway at Bethany Reservoir State Recreation Area.

Figure 5.13-3b
KOP 1 - Simulation
Viracocha Hill BESS Project
Alameda County, California

Jacobs

5.13.6 Agencies and Agency Contacts

Agencies and contacts are provided in Table 5.13-14.

Table 5.13-14. Agency Contacts for Visual Resources

Issue	Agency	Contact
Site Certification for Opt-In Project (with environmental review under CEQA and Assembly Bill 52 Tribal Consultation)	California Energy Commission	Eric Knight Siting, Transmission and Environmental Protection Division Email: Eric.Knight@energy.ca.gov
Not applicable: Local approvals would be superseded by CEC approval under the Opt-in Program	Alameda County Planning Division	Albert Lopez Planning Director Email: Albert.Lopez@acgov.org

5.13.7 Permits and Permit Schedule

Because of the exclusive jurisdiction of the CEC, no other land use permits are required for the Project.

5.13.8 References

Alameda County. 1966. Scenic Route Element of the General Plan. Amended 1994. https://www.acgov.org/cda/planning/generalplans/documents/Scenic_Route_Element_General_Plan_1966.pdf. Accessed February 2025.

Alameda County. 1994. East County Area Plan, A Portion of the Alameda County General Plan. Volume 1 Goals, Policies, and Programs. May 5. Updated October 2016 and November 2020. https://www.acgov.org/cda/planning/generalplans/documents/EastCountyAreaPlancombined.pdf. Accessed February 2025.

Alameda County. 2010. General Maps of Unincorporated Alameda County. March. https://acgov.org/cda/planning/ordinance/documents/AlaCoDemogrmap_reduced.pdf. Accessed February 2025.

Alameda County. 2014. Altamont Pass Wind Resource Area Repowering Final Program Environmental Impact Report. October. https://www.acgov.org/cda/planning/landuseprojects/documents/apwra/Complete_Final_Program_EIR.pdf. Accessed February 2025.

Alameda County. 2025. Community Development Agency, Current Development Projects, Wind Turbine Projects. https://www.acgov.org/cda/planning/landuseprojects/windturbineproject.htm. Accessed February 2025.

U.S. Department of Interior, Bureau of Land Management (BLM). 1984. Manual 8400-Visual Resources Management. April 5. https://www.blm.gov/sites/blm.gov/files/uploads/mediacenter_blmpolicymanual8400.pdf. Accessed February 2025.

U.S. Department of Interior, Bureau of Land Management (BLM). 1986a. Manual H-8410-1 - Visual Resource Inventory. January 17. https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_H-8410.pdf. Accessed February 2025.

U.S. Department of Interior, Bureau of Land Management (BLM). 1986b. Manual 8431 - Visual Resource Contrast Rating. January 17. https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_H8431.pdf. Accessed February 2025.

California Association of Environmental Professionals (CAEP). 2024. 2024 CEQA Statute & Guidelines Handbook. https://www.califaep.org/docs/2024_CEQA_Statute_and_Guidelines_Handbook.pdf. Accessed February 2025.

California Department of Transportation (Caltrans). 2018. California State Scenic Highway System Map. https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed February 2025.

International Commission on Illumination (CIE). 2017. Technical Report Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations. 2nd Edition. October 1. https://store.accuristech.com/cie/standards/cie-150-2017?product_id=1997388.

International Dark Sky Association. 2025. All International Dark Sky Places. https://darksky.org/what-we-do/international-dark-sky-places/all-places/. Accessed February 2025.

San Joaquin County. 2016. San Joaquin County General Plan Policy Document. December. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf. Accessed February 2025.

State of California. 2025. Governor's Office of Land Use and Climate Innovation. New to CEQA? https://lci.ca.gov/ceqa/. Accessed February 2025.

Sullivan, Robert, Jennifer Abplanalp, Sherry Lahti, Kevin Beckman, Brian Cantwell, and Pamela Richmond. 2014. Electric Transmission Visibility and Visual Contrast Threshold Distances in Western Landscapes. https://www.researchgate.net/publication/261557201_Electric_Transmission_Visibility_and_Visual_Contrast_Threshold_Distances_in_Western_Landscapes. Accessed February 2025.

U.S. Department of Transportation, Federal Highway Administration (FHWA). 2015. Guidelines for the Visual Impact Assessment of Highway Projects. Document No. FHWA-HEP-15-029. January. https://www.environment.fhwa.dot.gov/env_topics/other_topics/VIA_Guidelines_for_Highway_Projects.aspx. Accessed February 2025.

5.14 Waste Management

Section 5.14 Waste Management was originally docketed February 14, 2025, TN# 261781. A revised version of this section is being re-submitted as it has been updated to incorporate minor changes which ensures consistency between all sections.

5.14 Waste Management

This section discusses the potential effects on human health and the environment from nonhazardous and hazardous waste generated at the proposed Viracocha Battery Energy Storage System Project (Viracocha BESS or Project). Section 5.14.1 describes Project site investigations that have determined whether past activities have contaminated the site and the future waste streams that would be generated by the Project. Section 5.14.2 describes the Project's environmental analysis in terms of waste managed and waste disposal sites used. Section 5.14.3 discusses potential cumulative effects. Section 5.14.4 describes proposed mitigation measures. Section 5.14.5 presents laws, ordinances, regulations, and standards (LORS) that apply to the generated waste. Section 5.14.6 describes agencies that have jurisdiction over the generated waste and provides a list of agency contacts. Section 5.14.7 describes permits required for generated waste and a schedule for obtaining those permits. Section 5.14.8 provides the references used to prepare this section.

5.14.1 Affected Environment

This section discusses the condition of the approximately 14-acre Project site. Additionally, this section identifies the various nonhazardous and hazardous waste streams for Project construction and operation.

The Project consists of a battery energy storage system (BESS) facility and associated infrastructure, including a 90.7-Megawatt, and up to 362.8-Megawatt-per-hour BESS project in Alameda County, California, adjacent to the proposed Sand Hill Wind Repower Project. The Project will be located on a 443-acre parcel (APN 99B-7300-1-5) and will consist of a 17-acre area that will include an approximately 14-acre BESS yard, laydown area, substation, and retention pond. The exact design and location of these features will be refined as the Project moves forward. Additionally, the Project includes improvements to a 0.3-mile-long access road, a 0.15-acre road improvement, and an approximately 1,325-foot-long gen-tie line connecting to the Ralph Substation. If expanding the Ralph Substation is unavailable, a new switching station or a line-tap will be developed adjacent to the existing substation.

5.14.1.1 Site Investigations

A Phase I Environmental Site Assessment (ESA) was conducted in December 2024 by Jacobs for the Project site (Jacobs 2025) (Appendix 5.14A). The ESA was conducted in accordance with methods prescribed by the American Society for Testing and Materials document entitled “Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process (Designation: E 1527-21).”

The Phase I ESA report identified no Recognized Environmental Conditions (RECs) in the Project or study area.

5.14.1.2 Project Waste Generation

Wastewater, nonhazardous waste, and hazardous waste will be generated at the Project site during facility construction and operation.

Construction Phase

During construction, the primary waste generated will be nonhazardous waste. However, some hazardous waste will also be generated. All the hazardous wastes will be generated at the Project site. The types of waste and their estimated quantities are described in the following section and identified in Table 5.14-1.

Nonhazardous Solid Waste. The following nonhazardous waste streams could potentially be generated from construction of the Project:

- **Paper, Wood, Glass, and Plastics:** Over an estimated 14-month construction period, approximately 35 tons of paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty nonhazardous chemical containers. The waste will be placed in onsite dumpsters. These wastes will be recycled where practical. Waste that cannot be recycled will be disposed of periodically at a Class II or III landfill.
- **Concrete:** Approximately **500** ~~20~~ tons of excess concrete will be generated during construction of the Project. Waste will be recycled where practical, and nonrecyclable waste will be deposited in a Class III landfill.
- **Miscellaneous Waste:** Miscellaneous waste such as batteries, containers, solvents, and other waste will be recycled, sent to the vender for reconditioning, or disposed of at an appropriate facility, depending on the nature of the material (specific facility requirements are provided in Table 5.14-1).
- **Metal:** Over an estimated 14-month construction period approximately **7** ~~21.5~~ tons of metal, including steel from welding/cutting operations, packing materials, and empty nonhazardous chemical containers, as well as aluminum waste from packing materials and electrical wiring, will be generated during construction. Waste will be recycled where practical, and nonrecyclable waste will be deposited in a Class III landfill.

Table 5.14-1. Potential Wastes Generated during Construction

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Scrap wood, steel, plastic, paper, etc.	Construction	Normal refuse/ Universal Waste	5,000 pounds per month	Nonhazardous	Recycle and/or dispose of at a Class II or III landfill
Scrap metal	Construction	Parts, wire, etc.	~~20 tons per year~~[a] **1,000 pounds per month**	Nonhazardous	Recycle and/or dispose of at a Class II or III landfill
Concrete waste	Construction	Solids	~~20 tons~~ **500 tons**	Nonhazardous	Recycle and/or dispose of at a Class II or III landfill
Empty liquid material containers	Construction	Drums, containers, totes	50 containers	Nonhazardous solids	Containers <5 gallons will be disposed of as normal refuse. Containers>5 gallons will be returned to vendors for recycling or reconditioning.
Spent welding materials (welding rods, wire, grinding wheels, etc.)	Construction	Solids	100 pounds per month[b]	Hazardous	Recycle with vendors or dispose at a Class I landfill if hazardous.

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Waste oil filters	Construction equipment and vehicles	Solids	10 pounds per month[c]	Nonhazardous	Recycle at a permitted TSDF
Oily rags, oil sorbent	Cleanup of small spills	Hydrocarbons	10 pounds per month	Hazardous	Recycle at a permitted TSDF
Solvents, paint, adhesives	Maintenance	Varies	10 pounds per month	Hazardous	Recycle at a permitted TSDF
Spent lead acid batteries	Construction equipment, trucks	Heavy metals	5 batteries per year	Hazardous	Store no more than 10 batteries (up to one year) then recycle offsite
Spent alkaline and lithium-ion batteries	Mobile and hand-held equipment (excluding Megapacks)	Metals	10 batteries per month	Universal Waste solids	Recycle or dispose of offsite at a Universal Waste Destination Facility
Sanitary waste	Portable toilet holding tanks	Sewage	600 gallons per day	Nonhazardous liquid	Remove by contracted sanitary service
Stormwater	Rainfall	Water	1.224 acre-feet[e] (from 10-year storm event)	Nonhazardous liquid	Discharge into natural waterways through ditches and culverts
Fluorescent, mercury vapor lamps	Lighting	Metals and PCBs	10 pounds per month	Universal Waste solids	Recycle or dispose offsite at a Universal Waste Destination Facility

Note:

~~[a] 30 cubic yards~~

[b] Containers include <5 gallon containers and 55 gallon drums or totes

[c] Assumes one oil change

[d] Assumes 2,500 gallons for each generator times 16 units

[e] Calculated from Alameda County Hydrology Manual for 10-year storm event Sanitary waste based on 8 portable toilets in use Concrete waste based on 10% of the approximate foundations for Tesla Megapack 2XL containers and associated equipment quantity of 108 containers

CTG = Controlled Techniques Guidance
RCRA = Resource Conservation and Recovery Act
TSDF = Treatment, Storage, and Disposal Facility

Wastewater. Wastewater generated during construction will include sanitary waste, stormwater runoff, and water from excavation dewatering during construction (due to depth of groundwater at the Project dewatering is unlikely to be necessary). These wastewaters could be classified as hazardous or nonhazardous depending on their chemical quality. Wastewater would be sampled and disposed of if found hazardous. Methods for disposing of nonhazardous wastewaters are identified in Section 5.14.4.1.

Hazardous Waste. Most hazardous waste generated during construction will consist of fluids, including lubricants and solvents. Other hazardous waste, such as oil filters, oily debris, welding materials and dried paint, may also be generated during construction.

Operation Phase

During Project operation, the primary waste generated will be nonhazardous waste. However, varying quantities of hazardous waste also will be generated periodically. The types of wastes and their estimated quantities are discussed in the following section.

Nonhazardous Waste. The Project will produce facility wastes typical of industrial operations and maintenance activities, such as broken or rusted metal, defective or malfunctioning equipment, electrical materials, empty containers, other miscellaneous solid waste, and typical refuse from the operations and maintenance (O&M) staff during monthly site visits. The quantity of all solid nonhazardous waste generated is estimated to be approximately 215 pounds per year. Where practical, this waste will be recycled; non-recyclable waste will be collected in a bin that will be collected and taken offsite regularly by the O&M staff and disposed of at a Class III landfill.

Hazardous Waste. Hazardous waste generated will include used lubricating oil, oily rags, batteries, and fire extinguishers. All hazardous materials will be used, stored, and disposed of in accordance with the manufacturer's specifications and consistent with applicable regulatory requirements. Workers will be trained to engage in safe work practices and to properly identify, handle, and dispose of any hazardous materials onsite.

Wastes potentially generated during operations at the facility are summarized in Table 5.14-2.

Table 5.14-2. Potential Wastes Generated during Project Operations

Waste	Origin	Composition	Estimated Quantity	Classification	Disposal
Fluorescent tubes	Lighting of maintenance areas	Metals	10 pounds per year	Universal Waste solids	Recycle or dispose of offsite at Universal Waste Destination Facility
Electronic components	Distributed control system, BESS instruments and equipment	Metals	100 pounds per year	Universal Waste solids	Recycle with an approved facility
Oily rags and sorbents	Maintenance, wipe down of equipment, cleanup of small spills	Hydrocarbons and cloth	5 pounds per year	Hazardous	Recycle with an approved facility or disposal by certified oil recycler
Controlled waste streams	Batteries and fire extinguishers	Controlled substance	50 pounds per year	Hazardous	Recycle with an approved facility or disposal by a certified waste hauler

5.14.2 Environmental Analysis

5.14.2.1 Significance Criteria

A project may have a significant effect on the environment in terms of waste management if it meets the following criteria (California Environmental Quality Act Guidelines Section 15002[g], Appendix G):

- Be located on a site that is included on a list of hazardous materials sites (Cortese List) compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Have solid waste disposal needs beyond the capacity of appropriate landfills to accommodate them.

The risks or hazards posed by the transportation of hazardous materials, including hazardous wastes, are described and analyzed in Section 5.5, Hazardous Materials Handling.

5.14.2.2 Cortese List

An examination of the California Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Site List (Cortese List) compiled pursuant to Government Code Section 65962.5 shows there are no sites currently on the list within 1,000 feet of the Project (DTSC 2024a). The closest listed site is the Altamont Landfill at 10840 Altamont Pass Road, Livermore, California, which is approximately 1.75 miles west of the proposed Project. Thus, it is highly unlikely that any impacts will result from Cortese-listed properties, nor will the Project present a significant hazard to the public or the environment.

5.14.2.3 Solid Waste Disposal

Nonhazardous waste (often referred to as municipal waste or garbage) will be recycled or deposited at a Class II or III landfill, based on the type of waste generated. Hazardous wastes will be delivered to a permitted offsite TSDF for treatment or recycling or will be deposited at a permitted Class I landfill. The following sections describe the waste disposal sites feasible for disposal of Project wastes (Table 5.14-3).

Nonhazardous Waste

Approximately ~~82~~ **542** total tons of nonhazardous waste will be generated during Project construction. An additional 110 pounds of nonhazardous waste will be generated during its operation on an annual basis. The nonhazardous wastes will be recycled to the extent possible, and what cannot be recycled will be disposed of at a permitted landfill as discussed in the following sections.

It is anticipated that all excavated soil will be used onsite for grading and leveling purposes. In the event that some excavated soil is not reused onsite, it will be classified for disposal on the basis of sampling completed once the soil is excavated and stockpiled. Soil determined to be nonhazardous may be suitable for reuse at a construction site or disposal at a regional disposal facility, depending on its characteristics.

There are two nonhazardous solid waste disposal facilities (landfills) within Alameda County. Information about solid waste facilities, operations, and disposal sites was obtained from the California Department of Resources Recycling and Recovery (CalRecycle) Solid Waste Information System (SWIS) (CalRecycle 2024). Table 5.14-3 presents a summary of solid waste disposal facilities within the County.

Waste Management owns the Altamont Landfill, a Solid Waste facility in Alameda County, approximately two miles from the Project site. The facility is located at 10840 Altamont Pass Rd, Livermore, CA 94550, on 2063.6 acres of land. The facility has a permit for solid waste, contaminated soil, and asbestos-containing waste, at a maximum throughput of 11,150 tons per day and a remaining capacity of 65.4 million cubic yards. Two enforcement actions have been identified at the facility since 2010, including a 2024 Notice of Non-Compliance and a 2016 Notice of Violation.

Table 5.14-3. Solid Nonhazardous Waste Disposal Facilities in the Project Vicinity

Landfill/Transfer Station	Location	Class	Permitted Capacity[a]	Remaining Capacity[a] (cubic yards)	Permitted Throughput[a] (tons per day)	Estimated Closure Date[a]	Violation of Minimum State Standards Noted[a]
Altamont Landfill & Resource Recovery	10840 Altamont Pass Rd Livermore, CA 94550	II, III	124,400,000	65,400,000	11,150	12/1/2027	None
Vasco Road Sanitary Landfill	4001 N Vasco Rd Livermore, CA 94551	II, III	40,207,100	11,560,000	2,158	12/31/2051	None

Note:

[a] Based on CalRecycle SWIS Database (CalRecycle 2024)

Republic Services of California I, LLC owns the Vasco Road Sanitary Landfill in Alameda County, approximately 6.2 miles from the Project site. The facility is located at 4001 N Vasco Road, Livermore, CA 94551, on 323 acres of land. The facility has a permit for solid waste and contaminated soil, at a maximum throughput of 2,518 tons per day and a remaining capacity of 11.6 million cubic yards. No enforcement actions have been identified at the facility since 2010.

Adequate landfill capacity exists; therefore, disposal of nonhazardous waste will not be a constraint on the Project development. Impacts related to landfill capacity will be less than significant.

Hazardous Waste

Limited hazardous waste may be generated at the Project and would be stored at the facility for less than 90 days. The waste will then be transported to a TSDF by a permitted hazardous waste transporter to an appropriately permitted facility. California has two active Class I landfill facilities that accept hazardous waste: Waste Management Kettleman Hills Landfill and Clean Harbor's Buttonwillow Landfill (DTSC 2024b). Class I landfill facilities vary considerably in what they can do with hazardous waste they receive. Some waste disposal facilities can only store waste, some can treat the waste to recover usable products, and others can dispose of the waste by incineration, deep-well injection, or landfilling. The State of California does not permit incineration and deep-well injection disposal of these materials. The following Class I landfills are available for disposal in California.

Kettleman Hills Landfill: This landfill, operated by Chemical Waste Management Inc., is on a 1,600-acre parcel that has 695 acres of permitted land for management of federal- and state-listed hazardous wastes and municipal solid wastes. According to the 2003 Final Combination Permit, this landfill accepts Class I and II waste, including all hazardous waste except radioactive, medical, and unexploded ordinance. A comprehensive list of all hazardous waste accepted is included in Appendix A of the Draft Kettleman Hills Landfill Part B permit (DTSC, 2024c). Based on the aforementioned list, all anticipated hazardous waste generated by the Project is accepted by Kettleman Hills Landfill (DTSC 2024b). The Kettleman Hills facility currently has three operational landfills. (1) B-17 is permitted to have a 17.8-million-cubic-yard capacity Class II/III, (2) B-18 is permitted to have a 15.6-million-cubic-yard capacity classified as a Class I/II, and (3) B-19 is a permitted 7.7-million-cubic-yard capacity classified as a Class II/III landfill. Currently the B-18 hazardous waste landfill is accepting waste. B-18 has a permitted capacity of 107 million cubic yards, and is under review for expansion. Permit renewal for the facility is currently being reviewed by the DTSC and is expected to have an updated closure date of January 2055.

Clean Harbor's Buttonwillow Landfill: This landfill is permitted at 13.25 million cubic yards, can accept 10,500 tons per day, and is permitted to accept waste until 2040 (CalRecycle 2024). Buttonwillow has been permitted to manage a wide range of hazardous wastes, including Resource Conservation and Recovery Act (RCRA) hazardous wastes, California hazardous waste, and nonhazardous waste for stabilization treatment, solidification, and landfill. The landfill can handle waste in bulk (solids and liquids) and in containers. Typical waste streams include nonhazardous soil, California hazardous soil, hazardous soil for direct landfill, hazardous waste for treatment of metals, plating waste, hazardous and nonhazardous liquid, and debris for microencapsulation (CalRecycle 2024).

5.14.2.4 Waste Disposal Summary

The Project will generate nonhazardous waste that will add to the total waste generated in Alameda County and in California. However, there is adequate recycling and landfill capacity in California to recycle and dispose of the waste generated by the Project. Between recycling and offsite transport, it is estimated that the Project will generate approximately 110 pounds per year from operations. According to CalRecycle, approximately 1,153,828 tons of waste was landfilled within Alameda County in 2023 (CalRecycle 2024). The Project's contribution will likely represent an insignificant percent (less than 0.1%) of the total waste landfilled in the county (CalRecycle 2024). Therefore, the impact of the Project on solid waste recycling and disposal capacity will not be significant.

Hazardous waste generated will consist of used oil, oily rags, batteries, and fire extinguishers. Hazardous waste treatment and disposal capacity at the designated facilities are more than adequate for the requirements of this Project. Therefore, the effect of the Project on hazardous waste recycling, treatment, and disposal capacity will not be significant.

5.14.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code Section 21083; Title 14 California Code of Regulations, Title 14, Sections 15064[h], 15065[c], 15130, and 15355).

The quantities of nonhazardous wastes that would be generated during the Project construction and operation would be relatively low; approximately 82 tons (total) of solid waste during construction and approximately 110 pounds per year during operation. Recycling efforts would be prioritized wherever practical, and capacity is available in a variety of treatment and disposal facilities near the Project area.

Approximately 284,847 tons of solid waste were landfilled in Alameda County in 2020, and therefore the cumulative operational contribution will likely represent less than 1% of the total waste landfilled in the County (CalRecycle 2024). Regarding hazardous waste, less than 1 ton will be generated during construction, and only minimal quantities are estimated during operation. There is sufficient capacity at the designated TSDFs.

Additionally, there are 24 proposed projects within a 6-mile radius of the site: three energy storage facilities, eight associated with power generation, one compost facility, one transmission line, one highway widening project, one airport development plan, and nine residential or commercial developments (Figure 2-6). Existing and future projects proposed are subject to, and will follow, federal, state, and local laws and ordinances for waste management; thus, cumulative effects are not significant. Further, adequate capacity exists at both nonhazardous waste and hazardous waste landfills. Therefore, the impact of the Project on solid waste recycling and disposal capacity will not be significant.

5.14.4 Mitigation and Waste Management Methods

The handling and management of waste generated by the Project will follow the hierarchical approach of source reduction, recycling, and disposal. The first priority will be to reduce the quantity of waste generated through pollution prevention methods (such as high-efficiency cleaning methods). The next level of waste management will involve reusing or recycling wastes (such as used oil and battery recycling). Offsite disposal will be used for residual wastes that cannot be reused or recycled.

The following sections present methods for managing nonhazardous and hazardous waste generated by the Project.

5.14.4.1 Construction Phase

The following sections describe the handling requirements and mitigation measures for construction waste.

Nonhazardous Wastes

Nonhazardous solid waste generated during construction will be collected in onsite dumpsters and will be picked up periodically by an appropriate landfill facility.

Wastewater generated during construction will include sanitary waste and could include excavation and stormwater runoff. Due to the depth of groundwater in the project vicinity dewatering is not anticipated. Sanitary waste will be collected in portable, self-contained toilets and disposed of by a contracted sanitary service. Stormwater runoff will be managed in accordance with a stormwater management permit, which

will be obtained before construction starts. A plan for erosion and sediment control during construction will be developed as part of the Stormwater Management Plan (SWMP) and Stormwater Pollution Prevention Plan (SWPPP) necessary for a general construction permit in the State of California. Nonhazardous wastewater generation will be minimized, where feasible, by water conservation and reuse measures, such as dust control and road watering.

Hazardous Wastes

Most hazardous waste generated during construction will consist of oily waste, cleaning fluids, and solvents. Some waste in the form of welding materials and dried paint may also be generated. Nonhazardous materials will be used whenever possible to minimize the quantity of hazardous waste generated. The construction contractor will be the generator of hazardous construction waste and will be responsible for proper handling in compliance with all applicable federal, state, and local laws and regulations, including licensing, training of personnel, accumulation limits and times, and reporting and recordkeeping. The hazardous waste will be collected in satellite accumulation containers near the points of generation. This waste will be moved to the contractor's 90-day hazardous waste storage area, located at the plant construction laydown area. The waste will be delivered to an authorized hazardous waste management facility before expiration of the 90-day storage limit.

5.14.4.2 Operation Phase

The following sections describe handling requirements and mitigation measures for waste generated during operation.

Nonhazardous Wastes

Solid nonhazardous waste generated during facility operations will be collected in onsite trash cans and picked up during monthly site visits for disposal at an appropriate landfill facility.

No sanitary waste will be generated during operations.. Drainage ditches will be used along the perimeter of the site to intercept onsite and offsite flows. Culverts will be placed under the entrance roads to carry those flows offsite. Riprap will be at the outlets of each ditch and culvert to dissipate energy and prevent erosion. A detention basin is proposed to be used at the site to mitigate the effects of higher runoff rates from the development of the site. Stormwater will be discharged into the natural waterways.

Stormwater management focused on the inclusion of temporary and permanent BMPs to manage runoff through the project site. Permanent methods include site-wide vegetation, detention basins, and preservation of existing drainage patterns.

Hazardous Wastes

To avoid the potential effects on human health and the environment from handling and disposing of hazardous wastes, procedures will be developed to ensure proper labeling, storage, packaging, recordkeeping, and disposal of all hazardous wastes. The following general procedures will be employed:

- As the site is anticipated to generate less than 1,000 kg/month of non-acute hazardous waste the Project will be classified as a Small Quantity Generator and will obtain a site-specific U.S. Environmental Protection Agency (EPA) identification number that will be used to manifest hazardous waste from the Project. Hazardous waste from the Project will be stored onsite for less than 180 days before offsite disposal, treatment, or recycling.
- Hazardous wastes will be accumulated at the generating facility according to the Title 22 California Code of Regulations requirements for satellite accumulation.
- Hazardous wastes will be stored in appropriately segregated storage areas surrounded by berms to contain leaks and spills. The bermed areas will be sized to hold the full contents of the largest single

container and, if outdoors and not roofed, will be sized for an additional volume for the rainfall associated with a 25-year, 24-hour storm event.

- As needed, the limited amount of hazardous wastes will be collected by a licensed hazardous waste hauler using a hazardous waste manifest. Wastes will be shipped only to authorized hazardous waste management facilities. Biannual hazardous waste generator reports will be prepared and submitted to DTSC. Copies of manifests, reports, waste analyses, and other documents will be kept at the Applicant's home office and will remain accessible for inspection for at least three years.
- Employees will be trained in hazardous waste procedures, spill contingencies, and waste minimization.
- Procedures will be developed to reduce the quantity of hazardous waste generated. Nonhazardous materials will be used instead of hazardous materials whenever practical, and wastes will be recycled whenever practical.

To minimize the quantity of hazardous waste deposited in landfills, the following practices will be used:

- Spent oil filters and oily rags will be recycled.
- Transformers (containing mineral oil) and circuit breakers (containing sulfur hexafluoride) will be managed according to manufacturer instructions.
- Lead acid batteries and battery electrolyte solution will be recycled using an approved battery recycling facility.
- Lithium ion batteries will be recycled using an approved battery recycling facility.

5.14.4.3 Facility Closure

When the Project is closed, both nonhazardous and hazardous wastes must be handled properly. Closure can be temporary or permanent. Temporary closure would be for a period greater than the time required for normal maintenance, including economic or mechanical replacements or overhaul. Causes for temporary closure could be flooding of the site or damage to the plant from earthquake, fire, storm, or other natural causes. Permanent closure would consist of a cessation in operations with no intent to restart operations and could result from the age of the plant, damage to the plant beyond repair, economic conditions, or other unforeseen reasons. Handling of wastes for these two types of closure are discussed in the following sections.

Temporary Closure

For a temporary closure, where there is no release of hazardous materials, facility security will be maintained on a 24-hour basis, and the California Energy Commission Compliance Project Manager will be notified. Depending on the length of shutdown necessary, a contingency plan for the temporary cessation of operations will be implemented. This plan will be prepared as described in Section 2.3. The plan will be developed to ensure conformance with all applicable LORS and the protection of public health and safety and the environment. The plan, depending on the expected duration of the shutdown, would include the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS, as discussed in Section 5.14.5.

If the temporary closure is in response to facility damage, or where there is a release or threatened release of hazardous waste or materials into the environment, procedures will be followed as set forth in the applicable risk management, spill control, or emergency action plans. Procedures include methods to control releases, notification of applicable authorities and the public, emergency response, and training for generating facility personnel in responding to and controlling releases of hazardous materials and hazardous waste. Once the immediate problem of hazardous waste and materials release is contained and cleaned up, temporary closure will proceed as described for a closure where there is no release of hazardous materials or waste.

Permanent Closure

The planned life of the generation facility is 30 years, although operation could be longer. When the facility is permanently closed, the handling of nonhazardous and hazardous waste and materials will be part of a decommissioning plan that will be developed and submitted to the California Energy Commission for review at least 12 months prior to planned facility closure. The plan will comply with applicable LORS and will attempt to maximize the recycling of facility components. The facility will be cleaned and the facility components will be salvaged to the greatest extent possible. Listed hazardous waste and wastes found to be hazardous will be transferred to a permitted Class I landfill. Nonhazardous wastes will be transferred to a permitted Class II or Class III landfill as appropriate for each waste. These solids will be managed and disposed of properly so as not to cause significant environmental or health and safety impacts.

The site will be secured 24 hours per day during the Project decommissioning activities.

Monitoring

Because the environmental impacts caused by construction and operation of the facility are expected to be minimal, extensive monitoring programs will not be required. Generated waste, both nonhazardous and hazardous, will be monitored during Project construction and operation in accordance with the monitoring and reporting requirements mandated by the regulatory permits to be obtained for construction and operation.

5.14.5 Laws, Ordinances, Regulations, and Standards

Nonhazardous and hazardous waste handling at the Project will be governed by federal, state, and local LORS. Applicable LORS address proper waste handling, storage, and disposal practices to protect the environment from contamination and to protect facility workers and the surrounding community from exposure to nonhazardous and hazardous waste. Table 5.14-4 presents a summary of the LORS applicable to waste handling for the Project.

Table 5.14-4. LORS for Waste Management

Laws, Ordinances, Regulations, and Standards	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Federal			
RCRA Subtitle D	Regulates design and operation of nonhazardous solid waste landfills. Project solid waste will be collected and disposed of by a collection company in conformance with Subtitle D.	CalRecycle	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
RCRA Subtitle C	Controls storage, treatment, and disposal of hazardous waste. Hazardous waste will be handled by contractors in conformance with Subtitle C.	DTSC	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
Clean Water Act	Controls discharge of wastewater to the surface waters of the United States.	RWQCB	Sections 5.14.2.3, 5.14.2.4, and 5.14.3

Laws, Ordinances, Regulations, and Standards	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
State			
CEQA	Requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible.		Entire document
CIWMA	Controls solid waste collectors, recyclers, and depositors. Project solid waste will be collected and disposed of by a collection company in conformance with CIWMA.	CalRecycle	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
HWCL	Controls storage, treatment, and disposal of hazardous waste. Hazardous waste will be handled by contractors in conformance with the HWCL.	DTSC	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
Porter-Cologne Water Quality Control Act	Controls discharge of wastewater to surface waters and groundwaters of California.	RWQCB	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
California Fire Code	Controls storage of hazardous materials and wastes and the use and storage of flammable/combustible fluids. Wastes will be accumulated and stored in accordance with Fire Code requirements. Permits for storage containers will be obtained, as needed, from the ICFPD.	Alameda County Fire Department	Section 5.5.6
Assembly Bill 341/ State Bill 1018 – Mandatory Commercial Recycling	Requires commercial businesses generating four cubic yards per week or more of solid waste to adopt recycling practices.	CalRecycle	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
CCR Title 24, Part II (CALGreen Standards)	Establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency, water conservation, material conservation, and interior air quality.	CalRecycle	Sections 5.14.1, 5.14.4.1, and 5.14.4.2
CCR Title 22, Division 45	Controls storage, treatment, and disposal of hazardous waste under the DTSC	CalRecycle	Sections 5.14.1, 5.14.4.1, 5.14.4.2

Laws, Ordinances, Regulations, and Standards	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Local			
Hazardous Materials Generator Program – CUPA various programs	The ACDEH Hazmat Division is certified by the California Environmental Protection Agency as the local CUPA for Alameda County that regulates and conducts inspections of businesses that handle hazardous materials, hazardous wastes, and/or have underground storage tanks. The Project will comply with Hazardous Materials Business Plan requirements concerning storage and handling of hazardous materials and wastes, and will also cooperate with the agency on resolution of any environmental issues at the site.	ACDEH 1131 Harbor Bay Parkway Alameda, CA 94502-6577 510.567.6841 Matthew.soby@acgov.org	Sections 5.14.2.3, 5.14.2.4, and 5.14.3
ACDEH, Office of Solid/Medical Waste and Body Art Program	Acts as Local Enforcement Agency for CalRecycle.	ACDEH 1131 Harbor Bay Parkway Alameda, CA 94502-6577 510.567.6841 Matthew.soby@acgov.org	Sections 5.14.2.3, 5.14.2.4, and 5.14.3

Notes:
ACDEH = Alameda County Department of Environmental Health
CCR = California Code of Regulations
CEQA = California Environmental Quality Act
CIWMA= California Integrated Waste Management Act
CUPA = Certified Unified Program Agency
DTSC = Department of Toxic Substances Control
HWCL = Hazardous Waste Control Law
RCRA = Resource Conservation and Recovery Act
RWQCB = Regional Water Quality Control Board

5.14.5.1 Federal LORS

EPA regulates wastewater under the 1972 Amendments to the Federal Water Pollution Control Act, commonly known as the Clean Water Act. The federal statute that controls nonhazardous and hazardous waste is the RCRA 42 United States Code 6901, et seq. RCRA's implementing regulations are found in Title 40 Code of Federal Regulations, Parts 260 et seq. Subtitle D assigns responsibility for the regulation of nonhazardous waste to the states; federal involvement is limited to establishing minimum criteria that prescribe the best practicable controls and monitoring requirements for solid waste disposal facilities. Subtitle C controls the generation, transportation, treatment, storage, and disposal of hazardous waste through a comprehensive "cradle-to-grave" system of hazardous waste management techniques and requirements. It applies to all states and to all hazardous waste generators (above certain levels of waste produced). Additional requirements for small quantity generators have been established in the Generator Improvements Rule. The Project will conform to these laws in its generation, storage, transport, and disposal of any hazardous waste generated at the facility, as well as its communications with local emergency responders. EPA has delegated its authority for implementing the law to the State of California.

5.14.5.2 State LORS

Wastewater is regulated by the State Water Quality Control Board and RWQCB under the Porter-Cologne Water Quality Control Act. Nonhazardous waste is regulated by the CIWMA of 1989, found in Public Resources Code Sections 40000 et seq. This law provides an integrated statewide system of solid waste management by coordinating state and local efforts in source reduction, recycling, and land disposal safety. Counties are required to submit Integrated Waste Management Plans to the State. This law directly affects Alameda County and the solid waste hauler and disposer that will collect the Project solid waste. It also affects the Project to the extent that hazardous wastes are not to be disposed of along with solid waste.

RCRA allows states to develop their own programs to regulate hazardous waste. The programs must be at least as stringent as RCRA. California has developed its own program in HWCL (Health and Safety Code Sections 25100 et seq.). Because California has elected to develop its own program, HWCL performs essentially the same regulatory functions as RCRA and is the law that will regulate hazardous waste at the Project. However, HWCL includes hazardous wastes not classified as hazardous waste under RCRA. Because hazardous wastes will be generated at the Project during construction and operation, HWCL will require the Applicant to adhere to storage, recordkeeping, reporting, and training requirements for these wastes.

State law (Assembly Bill 341/Senate Bill 1018) requires businesses that generate 4 cubic yards or more of commercial solid waste per week to institute a recycling program. The Applicant will avail itself of opportunities provided by the franchised waste hauler and disposal companies to divert as much waste as possible from landfills and, instead, will recycle the materials.

5.14.5.3 Local LORS

For solid nonhazardous waste, the laws are administered and enforced primarily by the ACDEH. The ACDEH will serve as CUPA for the Project and will advise on the health effects of leaks and spills of hazardous materials and hazardous waste.

Local agency requirements and LORS associated with the Project will be addressed before the construction and operation of the facility, and the facility will conform to all local requirements. These include the need to file a Hazardous Material Business Plan (HMBP) using the California Environmental Reporting System (CERS) submittal system, which will allow the storage of hazardous materials and wastes in accordance with state and local regulations. The HMBP will be updated annually in accordance with applicable regulations.

For emergency incidents, the Alameda County Fire Department will be the first responder with the nearest fire station, Alameda County Fire Department Station No. 20, located at 7000 East Avenue, L-388, Livermore, CA. In the event additional support is needed the Fire Department would then contact the nearest fire station, Mountain House Fire Station No. 1 located at 911 Tradition Street, Mountain House, CA 95391, approximately 4 miles from the Project site. Additional information on emergency response is provided in Section 5.5, Hazardous Materials, and Section 5.16, Worker Health and Safety.

5.14.5.4 Codes

The design, engineering, and construction of hazardous waste storage and handling systems will be in accordance with all applicable codes and standards, as follows:

- California Building Code
- California Fire Code
- Alameda County Code

5.14.6 Agencies and Agency Contacts

Several agencies, including EPA at the federal level and DTSC and the California Environmental Protection Agency – CalRecycle at the state level, regulate nonhazardous and hazardous waste and will be involved in the regulation of the waste generated by the Project. The regulations, however, are administered and enforced primarily through the ACDEH, which is the designated CUPA for Alameda County, and the Alameda County Public Health Department, Environmental Health Services. The persons to contact for nonhazardous and hazardous waste management are listed in Table 5.14-5.

Table 5.14-5. Agency Contacts for Waste Management

Issue	Agency	Contact
Nonhazardous Waste		
Solid Waste and Recycling	Office of Solid/Medical Waste Management & Body Art Programs	Matthew Soby 1131 Harbor Bay Parkway Alameda, California 94502-6577 Telephone: 510.567.6790 Fax: 510.337.9234 Matthew.soby@acgov.org
Hazardous Waste		
Hazardous Waste/HMBP[a]	Office of Solid/Medical Waste Management & Body Art Programs	Matthew Soby 1131 Harbor Bay Parkway Alameda, California 94502-6577 Telephone: 510.567.6790 Fax: 510.337.9234 Matthew.soby@acgov.org

Note:

[a] Approvals would be superseded by California Energy Commission approval of Project under the opt-in program

5.14.7 Permits and Permit Schedule

The temporary storage of hazardous wastes at the Project will be included in the Project HMBP to be submitted to the ACDEH, as described in Section 5.5, Hazardous Materials. No additional permits are required.

5.14.8 References

Alameda County Fire Department. 2024. Personal communication between Station 21 On-Duty Battalion Commander and James Verhoff, Jacobs; discussed fire department current information, staffing, and provided the most updated contact information. November 25.

Alameda County Fire Department. 2025. Personal communication between Station 20 and Sam Schoevaars, Jacobs; discussed first response fire department. January 29.

California Department of Resources Recycling and Recovery (CalRecycle). 2024. Solid Waste Information System (SWIS) Database, Alameda County. Available online: https://www2.calrecycle.ca.gov/SolidWaste/Site/Search. November 20.

California Department of Toxic Substances Control (DTSC). 2024a. *DTSC's Hazardous Waste and Substances Site List (Cortese List)*, Alameda County. Available online: EnviroStor Database. November 14.

California Department of Toxic Substances Control (DTSC). 2024b. *Generator Improvement Rules.* Available online: Generator Improvements Rule | Department of Toxic Substances Control. November 14.

California Department of Toxic Substances Control (DTSC). 2024c. *RCRA Equivalent Hazardous Waste Facility Permit (Draft).* April 2024.

Environmental Data Resources, LLC. 2024. *Sand Hill Wind Project EDR Radius Map, Sand Hill Wind Project.* December.

Waste Management, Inc. 2024. November 27. Available online: https://altamontlandfill.wm.com/index.jsp.

5.15 Water Resources

Section 5.15 Water Resources was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.16 Wildfire

Section 5.16 Wildfire was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

5.17 Worker Health and Safety

Section 5.17 Worker Health and Safety was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.

6 Alternatives

Section 6 Alternatives was docketed February 14, 2025, TN# 261781 and is not included in this submittal package. A copy of this section may be found online at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=25-OPT-01.