AECOM

Draft General Plan Update

October 2024

CALIFORNIA STATE PARKS SINCE 1864 OHV

Carnegie

STATE VEHICULAR RECREATION AREA

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Table of Contents

1. Introduction 1-1
1.1 Local and Regional Context 1-1
1.2 Purpose of Acquisition 1-1
1.3 Sense of Place 1-5
1.4 Site Characteristics 1-5
1.5 Purpose of the General Plan 1-5
1.6 Organization of the General Plan 1-5
1.7 Subsequent Planning 1-6
1.8 The Planning Process 1-7
1.8.1 Overview of the Planning Process 1-7
1.8.2 Planning Framework 1-7
1.8.3 History and Interagency and Stakeholder Involvement 1-8
2. Existing Conditions 2-1
2.1 Regional Land Use and Facilities 2-1
2.1.1 Regional and Surrounding Land Use 2-1
2.1.2 Regional Recreation Facilities 2-2
2.2 Existing Carnegie SVRA Land Use and Facilities 2-6
2.2.1 Land Use 2-6
2.2.2 Circulation and Access 2-6
2.2.3 Facilities 2-7
2.3 Resource Values 2-13
2.3.1 Physical Resources 2-13
2.3.2 Biotic Resources 2-59
2.3.3 Cultural Resources 2-89
2.3.4 Aesthetic Resources 2-97
2.3.5 Sound 2-102
2.4 Operations and Maintenance 2-104
2.4.1 Facility Management 2-104
2.4.2 Public Safety 2-107
2.5 Interpretation and Education 2-108
2.5.1 Existing Interpretation and Education 2-108
2.5.2 Local, Regional, and Statewide Context 2-110
2.5.3 Support for Interpretation and Education 2-111
2.5.4 Interpretation Issues, Opportunities, and Constraints 2-111
2.6 Park Support 2-111
2.6.1 Volunteers 2-111
2.6.2 Cooperating Associations and Supporting Groups 2-111
2.7 Planning Influences 2-112
2.7.1 Systemwide Planning 2-112
2.7.2 Regional Planning 2-117
2.7.3 Regulatory Influences 2-118
2.7.4 Trends and Projections 2-155
2.7.5 Future Opportunities 2-158
3. Issues and Analysis 3-1
3.1 Introduction 3-1

3.2 Planning Assumptions 3-1
3.3 Issues and Analysis 3-2
3.3.1 Regional Planning Context 3-2
3.3.2 SVRA-wide Issues 3-3
4. The Plan 4-1
4.1 Purpose and Vision 4-1
4.1.1 Declaration of Purpose 4-1
4.1.2 SVRA Vision 4-1
4.2 State Parks Unit Classification 4-2
4.3 Land Use Management 4-2
4.3.1 Proposed Land Use and Facilities 4-2
4.3.2 Visitor Experience Areas 4-9
4.4 Goals and Guidelines 4-11
4.4.1 Visitor Experience and Opportunities (VEO) 4-12
4.4.2 Visitor Use Facilities 4-13
4.4.3 Visitor Experience Area Goals and Guidelines 4-16
4.4.4 Operations Facilities 4-16
4.4.5 Roads and Trails Management Plan (RTMP) 4-19
4.4.6 Parkwide Goals and Guidelines 4-19
4.4.7 Managing Visitor Capacity 4-43
4.5 Continued Planning and Issue Resolution 4-46
5. References 5-1

Figures

Figure 1-1 Vicinity Map 1-2
Figure 1-2 Planning Area 1-3
Figure 2-1 Surrounding Land Uses 2-3
Figure 2-2 Electrical Lines in the Planning Area and Vicinity 2-11
Figure 2-3 Geologic Formations in the Planning Area 2-17
Figure 2-4 Faults in the Planning Area Vicinity 2-19
Figure 2-5 Landslides in the Alameda County Portion of the Planning Area 2-23
Figure 2-6 Soil Types in the Planning Area 2-27
Figure 2-7 Planning Area Watersheds 2-36
Figure 2-8 Subwatersheds and Model Output Nodes 2-42
Figure 2-9 Floodplain Map 2-45
Figure 2-10 Water Quality Sampling Locations 2-51
Figure 2-11 2020 California Greenhouse Gas Emissions Inventory by Sector 2-58
Figure 2-12 Trends in California Greenhouse Gas Emissions (Years 2000 to 2020) 2-59
Figure 2-13 Habitat Types Found at Carnegie SVRA 2-63
Figure 2-14 Special-Status Plant Species Occurrences within a 5-Mile Search Radius 2-71
Figure 2-15 Special-Status Plant Species Occurrences within the Planning Area 2-73
Figure 2-16 Special-Status Animal Species Occurrences within a 5-Mile Search Radius 2-85
Figure 2-17 Special-Status Bird, Amphibian, and Reptile Occurrences Recorded during HMS Surveys 2-87
Figure 2-18 Representative Photographs 2-98
Figure 2-19 Representative Photographs 2-99
Figure 2-20 Representative Photographs 2-100
Figure 2-21 Representative Photograph 2-101
Figure 2-22 Noise Measurement Locations 2-105
Figure 2-23 County-Designated Land Uses in and near the Planning Area 2-119
Figure 2-24 Attendance at Carnegie SVRA over Time, by Pass Type 2-157

Figure 2-25 Average Attendance at Carnegie SVRA by Month, 2020-2022 2-158
Figure 4-1 General Plan Land Use Concept Map and Visitor Experience Areas 4-3
Figure 4-2 Proposed Projects 4-5

Tables

Table 1-1 Subsequent Planning Efforts Associated with the Carnegie SVRA General Plan 1-6
Table 1-2 Planning Hierarchy for Carnegie SVRA 1-8
Table 2-1 Abbreviated Geologic Time Scale 2-14
Table 2-2 Major Faults in the Project Region 2-16
Table 2-3 Alameda and San Joaquin County Soil Types Found within the Planning Area 2-29
Table 2-4 California Division of Mines and Geology Mineral Land Classification System 2-31
Table 2-5 Paleontological Inventory and Assessment 2-33
Table 2-6 Drainage Areas in the Corral Hollow Watershed 2-35
Table 2-7 Estimated Peak-Flow Rates for 24-Hour Storm Events and Stream Channel Locations 2-44
Table 2-8 Acreage of Vegetation Types in the Planning Area 2-65
Table 2-9 Special-Status Plant Species Documented in and Near the Planning Area – Species Within the Planning Area 2-75
Table 2-10 Special-Status Plant Species Documented in and Near the Planning Area–Species Documented Within 5 Miles of the Planning Area 2-76
Table 2-11 Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area–Invertebrates 2-79
Table 2-12 Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area–Reptiles and Amphibians 2-79
Table 2-13 Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area–Birds 2-81
Table 2-14 Special-Status Wildlife Species Observed or Assumed to Be Present in the Vicinity of Planning Area–Mammals 2-82
Table 2-15 Summary of Noise Measurements 2-103
Table 2-16 Summary of Existing Traffic Noise Levels Modeled in the Vicinity of the Planning Area 2-104
Table 2-17 Summary of Noise Level Standards Recommended by the U.S. Environmental Protection Agency 2-152
Table 2-18 Definitions of Level of Service 2-154
Table 2-19 City and County Population Growth 2-156
Table 2-20 Race/Ethnicity in Alameda and San Joaquin Counties in 2022 2-156
Table 4-1 Visitor Experience Areas 4-9
Table 4-2 Desired Outcomes and Indicators for Visitor Capacity 4-44

Photographs

Viewpoint 1 View westward along Corral Hollow Road near the intersection with I-580 2-98
Viewpoint 2 View northward across challenge and event areas on the Carnegie SVRA, with Corral Hollow Road and LLNL Site 300 beyond. 2-98
Viewpoint 3 View of Corral Hollow Creek facing east from the bridge at the Maintenance Yard. Note the power lines along Corral Hollow Road at left. 2-99
Viewpoint 4 View eastward from a hilltop west of the planning area, facing across the Central Valley with the Sierra Nevada in the background 2-99
Viewpoint 5 View northeast across the Carnegie SVRA with LLNL Site 300 facilities atop the hills in the background 2-100
Viewpoint 6 View of the top of the grade on Tesla Road from an area west of the planning area. 2-101
Viewpoint 7 View of a typical north-facing slope on the site of the Carnegie SVRA. 2-101

Acronyms and Abbreviations

ºF	degrees Fahrenheit
4WD	four-wheel-drive
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ADA	Americans with Disabilities Act
AG	Agriculture
ARB	California Air Resources Board
ATVs	all-terrain vehicles
B.C.E.	Before Common Era
B.P.	Before Present
BAAQMD	Bay Area Air Quality Management District
BACT	best available control technology
Basin Plan	Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region
BMPs	best management practices
CAA	federal Clean Air Act
CAAA	federal Clean Air Act Amendments of 1990
CAAQS	California ambient air quality standards
CAFE	light duty cars and trucks average fuel economy
cal B.P.	calibrated radiocarbon years Before Present
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
CARE	Community Air Risk Evaluation
Carnegie SVRA	Carnegie State Vehicular Recreation Area
CASSP	California Archaeological Site Stewardship Program
CBC	California Building Standards Code
CCAA	California Clean Air Act
CDFW	California Department of Fish and Wildlife
CDFW	formerly California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	Methane:
CHL	California Historical Landmark
CHRIS	California Historical Resources Information System
CHS	Campground Host Sites
CNDDB	California Natural Diversity Database
CNEL	Community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CR	Cultural Resource Management
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CTR	California Toxics Rule
CWA	Clean Water Act
dB	Decibels
DPM	diesel particulate matter
DWR	California Department of Water Resources
EACCS	East Alameda County Conservation Strategy
Eagle Act	Bald and Golden Eagle Protection Act
EBRPD	East Bay Regional Park District
EIR	environmental impact report

EISA	Energy Independence and Security Act of 2007
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	federal Endangered Species Act
ET	evapotranspiration
EV	electric vehicle
FEIR	Final EIR
FEMA	Federal Emergency Management Agency
FR	Federal Register
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts
General Plan	Carnegie State Vehicular Recreation Area General Plan Update
Geo	Geology
GHGs	greenhouse gases
GPS	global positioning system
GWP	global warming potential
HAPs	hazardous air pollutants
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
HHWP	Hetch Hetchy Water and Power
High GWP	High Global Warming Potential
HMA	Hot mixed asphalt
HMS	Habitat Monitoring System
I-580	Interstate 580
IE	Interpretation and Education
IEP	Interpretive and Educational Program
IMP	interpretation master plan
ISR	Indirect Source Review
LAFCo	Local Agency Formation Commission
LARPD	Livermore Area Recreation and Park District
LCFS	Low Carbon Fuel Standard
L_{dn}	Day-night average sound level
LED	light emitting diode
L_{eq}	Equivalent sound level
LEV	Low Emission Vehicle
LLNL	Lawrence Livermore National Laboratory
L_{max}	Maximum sound level
LOS	level of service
MACT	maximum available control technology
MCV	Manual of California Vegetation
MLD	most likely descendant
MPH	miles per hour
MPO	metropolitan planning organization
MS4s	Municipal Separate Storm Sewer Systems
MT	metric tons
MTC	Metropolitan Transportation Commission
MX	Motocross
MY	model year
N_2O	Nitrous Oxide
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NHTSA	National Highway Traffic Safety Administration
NOP	notice of preparation
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	U.S. Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRM	Natural Resource Management
OHMVR	Off-Highway Motor Vehicle Recreation
OHMVR Act	Off-Highway Motor Vehicle Recreation Act

OHV	Off-highway vehicle
OHV BMP Manual	OHV BMP Manual for Erosion and Sediment Control
OM	Operations and Maintenance
OOF	her Operations Facilities
OVF	Other Visitor Facilities
PFCs	Perfluorinated Chemicals
PG&E	Pacific Gas and Electric Company
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
$PM_{2.5}$	fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less
Porter-Cologne Act	Porter-Cologne Water Quality Control Act of 1969
POTW	Publicly Owned Treatment Works
PRC	California Public Resources Code
PV	photovoltaic
RFS	Renewable Fuel Standard Program
ROG	reactive organic gases
ROVs	recreational off-highway vehicles
RPS	Renewables Portfolio Standard
RS	Ranger Station
RTMP	Roads and Trails Management Plan
RTP	Regional Transportation Plan
RVs	recreational vehicles
SB	Senate Bill
Scoping Plan	Climate Change Scoping Plan
SCS	Sustainable Communities Strategy
SF_6	Sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
Soil Standard	2008 Soil Conservation Standard and Guidelines
SPPOs	State Parks Peace Officers
sq. ft.	square feet
SRI	SRI International
State Parks	California Department of Parks and Recreation
State SIP Strategy	2022 State Strategy for the State Implementation Plan
SUVs	sport utility vehicles
SVP	Society of Vertebrate Paleontology
SVRA	Carnegie State Vehicular Recreation Area
SWMP	Storm Water Management Plan
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
T-BACT	best available control technology for TACs
TCR	Tribal Cultural Resource
TDS	total dissolved solids
TSS	total suspended solids
UCD	University of California, Davis
UCMP	University of California Museum of Paleontology
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VegCAMP	Vegetation Classification and Mapping Program
VEO	Visitor Experience and Opportunities
VM	Visitor Management
VMT	vehicle miles travelled
VTA	Volunteer Training Area
Water	Water quality
WDRs	waste discharge requirements
White House	Edward B. Carrell House

WHPP	Wildlife Habitat Protection Plan
ZEV	zero emission vehicles
Zone X	500-year floodplain level

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1. Introduction

1.1 Local and Regional Context

Carnegie State Vehicular Recreation Area (Carnegie SVRA or the SVRA) is located on the border shared by Alameda and San Joaquin counties, 12 miles southeast of Livermore, and 12 miles southwest of Tracy (Figure 1-1) in a rural, primarily dry-farming, cattle ranching area in the hills between the Bay Area and the Central Valley. The roadway providing access to the SVRA is named Corral Hollow Road in San Joaquin County and Tesla Road in Alameda County. Visitors may access this roadway from Interstate 580 (I-580) in either county. A very small operations area for the SVRA (approximately 4 acres) is located north of Corral Hollow Road and includes staff offices and residences, and the SVRA water treatment facility (Figure 1-2).

Carnegie SVRA entrance station

A family riding together at Carnegie SVRA

1.2 Purpose of Acquisition

Carnegie SVRA became a unit of the California State Park system in July 1980. The 1,533-acre site, which had been used by off-highway vehicles (OHVs) since the 1940s, was operated as a private motorcycle park from 1970 to 1979 before being purchased by the California Department of Parks and Recreation (State Parks) using OHV Trust Funds. Legislative action (California Public Resources Code [PRC], Section 5006.48) authorized State Parks to plan, acquire, and develop the site for OHV use.

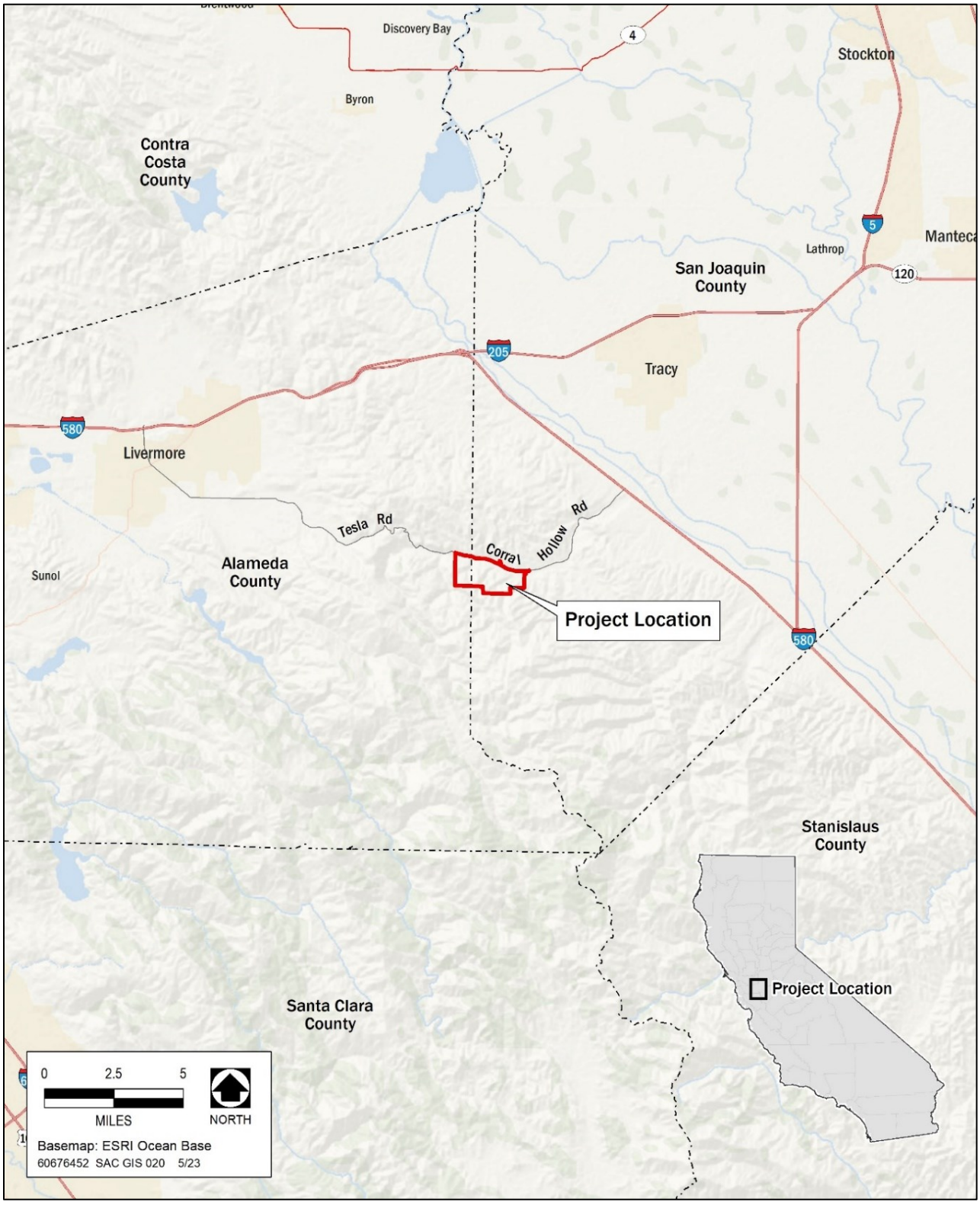

Figure 1-1. Vicinity Map

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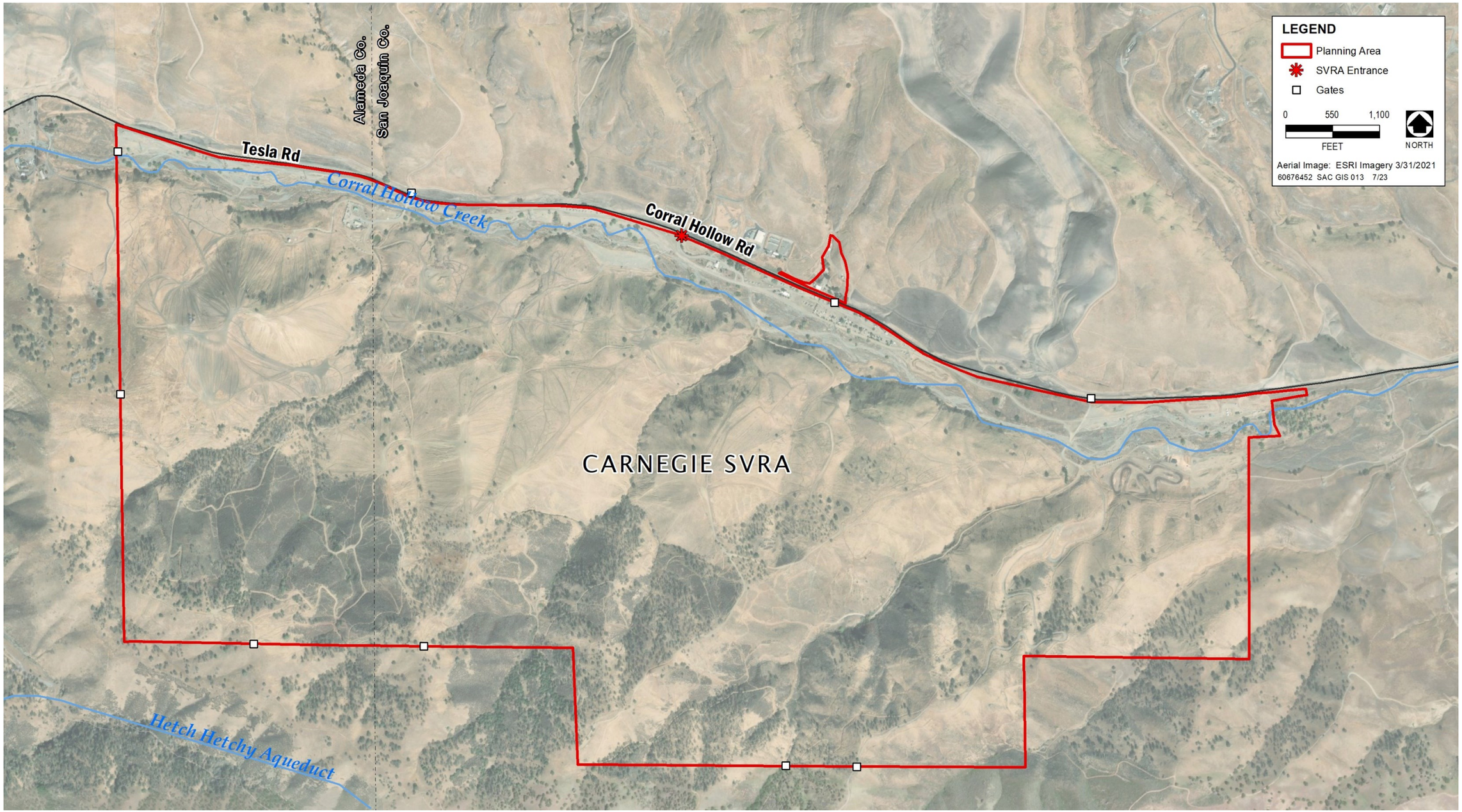

Source: State Parks 2022

Figure 1-2. Planning Area

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1.3 Sense of Place

Carnegie SVRA is mainly a destination for intermediate and advanced off-highway motorcycle riders from multiple age groups. Known for steep hillsides and challenging terrain, the SVRA attracts families, groups, and single riders who want to ride for a few hours, to camp and ride for several days, or compete in or watch hill climbs or other special events.

1.4 Site Characteristics

Carnegie SVRA comprises northeast-trending ridges with steep canyons and the Corral Hollow Creek floodplain. Corral Hollow Creek flows from west to east into the San Joaquin Valley. The hills rise abruptly from the floodplain with very steep slopes. A narrow flat floodplain corridor characterized by riparian habitat parallels Corral Hollow Creek on the south side of Corral Hollow Road/Tesla Road. The surrounding hills support grasslands, scrub, and oak woodlands. The SVRA's entrance is off Corral Hollow Road. The planning area for this *Carnegie State Vehicular Recreation Area General Plan Update* (General Plan) consists of the 1,533-acre SVRA, including the 4-acre SVRA operations area north of Corral Hollow Road.

1.5 Purpose of the General Plan

State Parks adopted the first general plan for Carnegie SVRA in 1981. Much has changed in the 42 years since the plan's adoption, including types of SVRA recreation, associated operations facility needs, and updates to environmental laws and regulations. Updating the Carnegie SVRA General Plan resulted in this new broad-based policy document that establishes a long-range vision for the SVRA and provides goals and guidelines to direct future improvements, services, and programs. By providing a clear purpose, a vision, and long- and short-term goals and guidelines, the General Plan defines the broadest possible management framework for program development, ongoing management, and public use of Carnegie SVRA. This framework is intended to guide day-to-day decision-making and serve as the basis for developing focused feasibility and management plans, project plans, and other management actions necessary to implement General Plan goals.

General Plans prepared under PRC 5002.2 do not expire; rather, they are reconsidered for amendments or revisions when circumstances and needs dictate or when substantial development considerations arise that were not envisioned in the general plan or evaluated during the general plan planning process.

1.6 Organization of the General Plan

This Carnegie SVRA General Plan is organized into five chapters:

- **Chapter 1, "Introduction"** introduces Carnegie SVRA and the General Plan.
- **Chapter 2, "Existing Conditions,"** describes existing conditions, facilities, and important resources.
- **Chapter 3**, **"Issues and Analysis,"** summarizes and analyzes key issues identified during the planning process.
- **Chapter 4, "The Plan,"** contains the proposed General Plan components: SVRA classification, purpose, vision, goals and guidelines, and proposed land use management.
- **Chapter 5, "References,"** lists references cited in Chapters 1 through 4.

1.7 Subsequent Planning

The Carnegie SVRA General Plan provides a framework to guide the management and planning for the SVRA. However, more specific guidance or details may become available during the development of future programs and projects, including management or project plans (Table 1-1). Any subsequent planning efforts must be consistent with the General Plan. If a subsequent program or project (e.g., a proposed change in use within a designated use area) is proposed that would not be consistent with the General Plan, an amendment or revision of the General Plan would be required before the program or project could be implemented, along with California Environmental Quality Act (CEQA) compliance.

Table 1-1. Subsequent Planning Efforts Associated with the Carnegie SVRA General Plan

Subsequent Plan Type	Description	Examples
Management plan	Management plans define the objectives, methodologies, and/or designs for accomplishing management goals. These plans are consistent with systemwide plans and policies and with the unit's general plan. Prepared as needed, management plans typically focus on specific management topics, goals, or issues.	• Resource management plans • Trail management plans • Operation plans • Interpretive plans • Concession plans
Specific project plan	Detailed implementation plans are needed to accomplish specific projects.	• Design concepts • Facility development plans (e.g., off-highway vehicle track, developed trail system)

A general plan is considered a "project" under CEQA and, therefore is subject to environmental review under CEQA. The proposed project is the adoption of a general plan, which itself would cause no environmental impacts; however, implementing actions included in the Carnegie SVRA General Plan could physically alter the environment. Possible actions that may result from adopting and implementing the General Plan have been anticipated, and the potential impacts of these actions have been analyzed in an environmental impact report (EIR). The EIR addresses all the points required by Article 9 of the CEQA Guidelines: existing setting, impact analysis, alternatives analysis, and cumulative impacts. The EIR for this General Plan is prepared as a separate volume.

The EIR evaluates the goals, guidelines, types of uses, and facilities described in this General Plan for their potential effects on the environment. The environmental analysis was prepared concurrently with the General Plan. In developing the General Plan land use concepts and goals and guidelines, the presence of sensitive resources throughout the planning area have been taken into consideration wherever possible to ensure that planned actions described in the General Plan, including future actions, will not cause significant environmental impacts.

The CEQA analysis detailed in the EIR accompanying this General Plan covers future projects as long as the projects are consistent with the General Plan's goals and guidelines. State Parks will review and document compliance with CEQA for all actions under this GP in accordance with the DPR Operations Manual Chapter 0600. Once the project details are known, the project manager would develop a project description describing the work to be performed and identify all applicable guidelines. Resource specialists would review and evaluate for project-specific effects that were not identified or fully examined in the GP EIR. District Environmental Coordinator (DEC) and OHMVRD will evaluate for consistency with the GP EIR. If the action is within the scope of the GP and no new effect or increase in severity of previously identified effect, these would be considered subsequent actions that are within the scope of the EIR and no additional CEQA document would be required.

Some actions described in the General Plan may require additional CEQA analysis before implementation. This additional analysis would be conducted once the project details are known before

project implementation, as described above. If the review by resource specialists identifies a new project-specific effect or increase in severity of previously identified effect, DEC and OHMVRD will evaluate the potential impact and recommend any appropriate subsequent environmental analysis and documentation that must be completed to advance project implementation.

According to CEQA Guidelines Section 15168, projects that may be implemented in the future as a result of adopting this General Plan must first be subjected to CEQA review, in light of the information in the General Plan EIR, to determine whether additional CEQA documentation is necessary. According to Section 15168 of the CEQA Guidelines, State Parks may refer to the EIR prepared for this General Plan as a starting point for a "tiered" CEQA analysis when implementing future projects that require additional environmental review.

The CEQA Guidelines also include the following provisions that apply to the use of this General Plan and accompanying EIR for the development of future facilities envisioned in the General Plan:

- **Section 15146(b).** An EIR on a project such as the adoption of a general plan should focus on the secondary effects that can be expected to follow from the adoption, but the EIR need not be as detailed as an EIR on the specific construction projects that might follow.
- **Section 15152(b).** Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects, including general plans. Tiering does not excuse the lead agency from adequately analyzing reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration. However, the level of detail contained in a first tier EIR need not be greater than that of the program, plan, policy, or ordinance being analyzed.
- **Section 15168(c)(5).** Program EIRs are most helpful if effects are dealt with as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR and no further environmental documents would be required.

1.8 The Planning Process

1.8.1 Overview of the Planning Process

The Carnegie SVRA General Plan process involved several key phases: data collection, researching existing conditions and evaluating resources, gathering public input, developing and evaluating land use concepts, selecting a preferred concept, and preparing the General Plan and EIR.

Researching existing conditions involved preparing a cultural resources survey, a wetland delineation, and a traffic study; conducting reconnaissance-level surveys for natural resources, site-specific mapping of vegetation communities, a noise and sound assessment, and a visitor survey; and reviewing technical documents and survey data. The specific steps used to gather input from the public, agencies, and other stakeholders are described in Section 1.8.3. Existing conditions information; identified opportunities and constraints; and public, agency, and other stakeholder input on land use alternatives were combined to develop goals, guidelines, and a land use plan.

1.8.2 Planning Framework

The Carnegie SVRA General Plan is consistent with the planning framework established by the Planning Division of State Parks. The classification, declaration of purpose, SVRA vision, goals and guidelines, and use areas established in the General Plan guide the specific development of Carnegie SVRA under guidance set forth by State Parks and State Parks' Off-Highway Motor Vehicle Recreation (OHMVR) Division. Table 1-2 describes the planning hierarchy that provides direction for the future of Carnegie SVRA.

Table 1-2. Planning Hierarchy for Carnegie SVRA

Planning Concept	Description
California State Parks Mission	The California State Parks mission is "*to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation*." All Department planning, resource management, and recreation access supports this mission statement.
OHMVR Division Mission	The OHMVR Division mission guides acquisition, planning, and management of the SVRAs as part of the division's responsibility to provide leadership for a statewide OHV program.
Classification	SVRA management, operation, and development are guided by the classification of a park unit. Carnegie is a State Vehicular Recreation Area.
Declaration of Purpose	The declaration of purpose is a broad statement of direction unique to each SVRA. Section 5090.43(a) of the California Public Resources Code requires SVRAs to be developed, managed, and operated to make the fullest public use of the outdoor recreational opportunities present, while balancing the protection of natural and cultural resources.
SVRA Vision	The vision statement is a view of the desired future conditions for Carnegie SVRA. It expresses what Carnegie SVRA should ultimately be and look like and what kinds of visitor experiences should be available in the future.
Goals and Guidelines	Goals are developed to address existing issues and provide ongoing guidance for SVRA management. Guidelines provide the direction the OHMVR Division will implement to achieve these goals.
Use Areas	Use areas allow for specialized management by area. These use areas are developed by considering a variety of factors: topographic features, resource values, ecological parameters, management issues and goals, types and intensities of use, and visitor use and experience. Targeted goals and guidelines are developed for each use area.

Notes: OHV = off-highway vehicle; OHMVR = Off-Highway Motor Vehicle Recreation; SVRA = State Vehicular Recreation Area

1.8.3 History and Interagency and Stakeholder Involvement

State Parks previously prepared a Carnegie SVRA General Plan Revision and associated EIR for the existing Carnegie SVRA and the adjacent Alameda-Tesla property (also known as the expansion area) owned by State Parks. While the General Plan Revision was approved and the EIR was certified by the OHMVR Commission in 2016, the Commission rescinded these decisions in 2021 because of several lawsuits. The lawsuits and the subsequent legislation requiring that the Alameda-Tesla expansion area not be designated as a SVRA resulted in State Parks electing to prepare a standalone General Plan Update and EIR for the existing Carnegie SVRA. State Parks will conduct a separate planning effort for the Alameda-Tesla property to determine a suitable classification and future use of the property.

On March 30, 2022, State Parks sent an email to approximately 1,900 e-mail addresses on the project contact and subscriber list. This email blast announced the public comment period for the notice of preparation (NOP) of the Carnegie SVRA General Plan Update and EIR. Additional email blasts include announcements for the public release of the Preliminary General Plan Update and Draft EIR, the availability of the Final General Plan Update and Final EIR, and the OHMVR Commission hearing to approve the General Plan and the OHVMR Division to certify the EIR.

While outreach efforts, including key stakeholder meetings, public workshops, and surveys, conducted prior to the approval of the General Plan Revision and EIR in 2016 include information gathered for both the existing SVRA and expansion area, all information gathered was considered, as applicable and feasible, by the planning team during development for the Carnegie SVRA General Plan Update. The team considered input from agencies, stakeholders, staff members, the public, and existing conditions when developing the draft concept, proposed projects, goals and guidelines, and environmental analysis.

1.8.3.1 Native American Consultation

State Parks issued Departmental Notice No. 2007-05, "Native American Consultation Policy & Implementation Procedures," in November 2007. The notice sets forth State Parks' policy for consultation with California Native peoples about activities that affect matters related to their heritage, sacred sites, and cultural traditions. General plans are included in the list of potential activities. In September 2011, Governor Brown ordered state agencies (including State Parks) to "encourage communication and consultation with California Indian Tribes… and permit elected officials and other representatives of tribal governments to provide meaningful input" (Governor's Executive Order B-10-11). State Parks conducted Native American consultation in accordance with Departmental Notice 2007-05 and Governor's Executive Order B-10-11.

As part of the consultation process, the Diablo Range District archaeologist contacted the Native American Heritage Commission (NAHC) to request a Native American contact list for the planning area. Of these California Native American tribes, the Northern Valley Yokut/Ohlone Tribe and the Confederated Villages of Lisjan requested consultation for this project.

The NAHC's review of the sacred lands files failed to identify sacred sites within Carnegie SVRA. However, two sacred sites were identified during consultation with Native American tribes on multiple site visits. The group also had concerns about impacts on a culturally sensitive site and botanical resources that are important for ceremonial uses in the Native American community.

State Parks has been committed to ongoing consultation with Native American tribes about the General Plan Update and has regularly met with tribe representatives, including representatives from the Confederated Villages of Lisjan and the Northern Valley Yokuts/Ohlone tribes, since 2022. The planning team received questions, concerns, comments, feedback, and ideas on improving the Park during consultation meetings, emails, and mail. The planning team considered all ideas, concerns, feedback, and comments to develop the preliminary General Plan Update. Additional consultation is ongoing and additional cultural resource inventories have been conducted at the SVRA as described in Chapter 2 "Existing Conditions".

1.8.3.2 Project Website

A Carnegie SVRA General Plan Update webpage served as the main portal for all communication about the General Plan Update. This website contained information about the planning process and schedule, links to background reports and documents, a mailing list signup link, and announcements of upcoming events. All materials used during public meetings, the Preliminary General Plan Update and Draft EIR and the Final General Plan Update and Final EIR and materials related to the OHMVR Commission hearing on the General Plan and EIR will also be posted on this website, when available.

Carnegie SVRA General Plan Update webpage

Visitors putting on their gear before a ride

2. Existing Conditions

2.1 Regional Land Use and Facilities

2.1.1 Regional and Surrounding Land Use

Carnegie State Vehicular Recreation Area (SVRA) is located in unincorporated Alameda and San Joaquin counties, approximately 12 miles east of downtown Livermore, and 12 miles southwest of Tracy, south of Corral Hollow Road. The SVRA is managed by the Diablo Range District of State Parks. To the north is the Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) property. The Alameda-Tesla Property, owned by State Parks and not currently open to the public, is located to the west and additional State Parks owned properties are to the north of Tesla Road (Figure 2-1). Open space, ranches, and rural residences are located to the east and south. Large ranches are located to the northwest and southwest of the planning area. The *Alameda County General Plan* designates the lands surrounding the planning area to the northwest and southwest as Agricultural/Grazing. Because of the ephemeral nature of Corral Hollow Creek, ranchers have constructed stock ponds throughout the watershed to supplement the water supply during the summer months. Cattle graze on private ranches within the headwaters of the Corral Hollow watershed. Within Baker's Ravine, a tributary of Corral Hollow Creek, private ranchers graze cattle along with goats and horses (State Parks 2012:5).

Northwest of Corral Hollow Road near Castle Rock is the 99.2-acre Corral Hollow Ecological Reserve, operated by the California Department of Fish and Wildlife (CDFW). The purpose of the reserve is to preserve key habitat for an array of reptile and amphibian species and to preserve riparian habitat for wildlife.

SRI International (SRI), which originally was part of the Stanford Research Institute, once operated an explosives-testing facility southeast of Carnegie SVRA. This facility is no longer in operation, and now belongs to a private landowner.

LLNL Site 300 straddles the Alameda/San Joaquin County line and forms the northeastern border of Carnegie SVRA (north of Corral Hollow Road). LLNL is a full-service research laboratory that focuses on science and technology associated with national security. The laboratory is operated and managed by the University of California for the U.S. Department of Energy (State Parks 2007a:39) and is largely self-sustaining. LLNL Site 300's 200 employees work in the facility's engineering, maintenance, security, environmental protection, fire, and administrative and facility support.

State Parks owns several single-family residential dwellings located along Corral Hollow Creek and west of Carnegie SVRA. One of these residences serves as a Diablo Range District office. A small private residential area containing single-family dwellings is also located along Corral Hollow Creek near Mitchell Ravine. A few houses that are located east of the SVRA are in the upper portion of the Corral Hollow watershed and belong to private ranches (State Parks 2012:5) (see Figure 2-1).

View of Mitchell Ravine

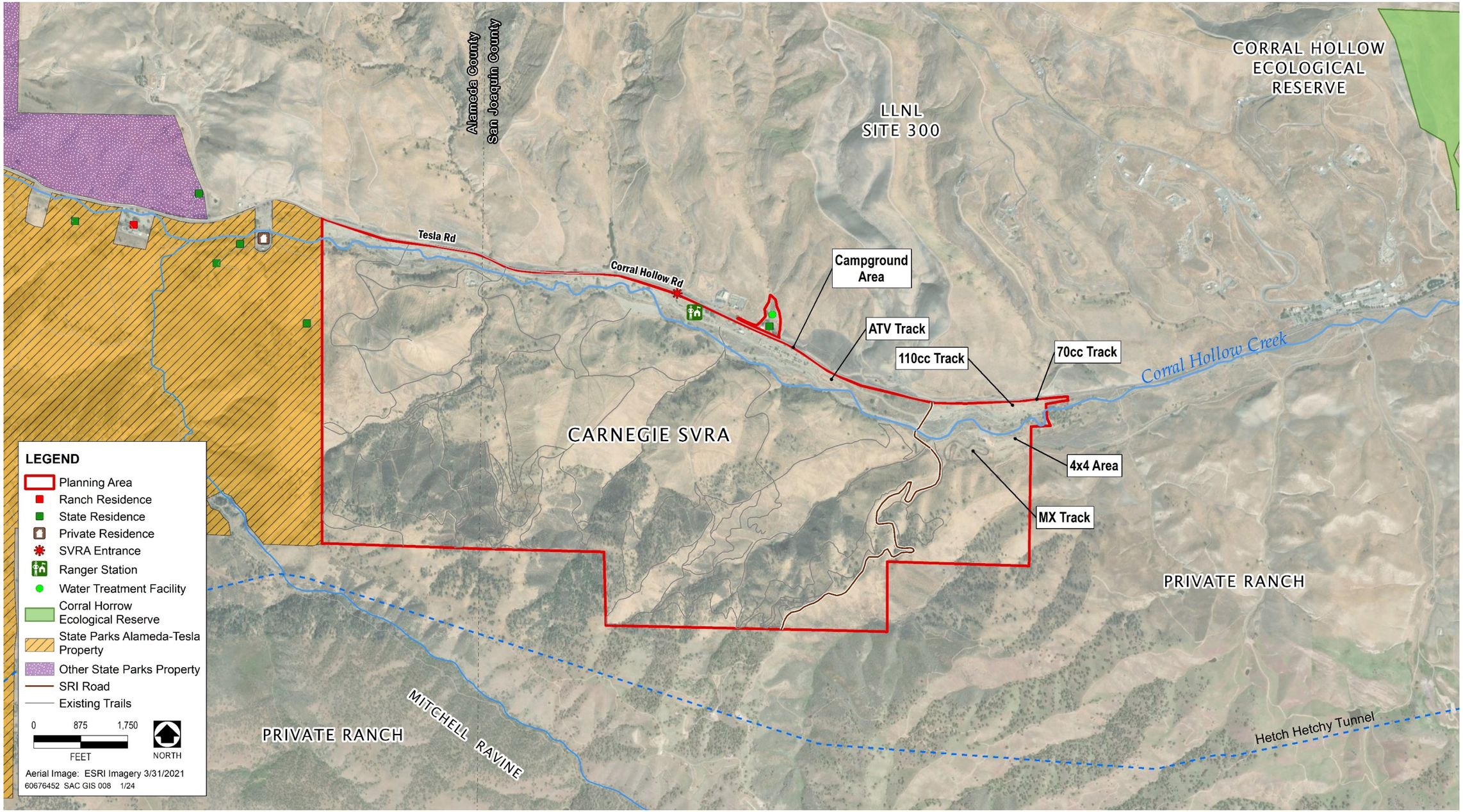
A tunnel used by the Hetch Hetchy Project passes beneath the upper reaches of Mitchell Ravine, a southern tributary to Corral Hollow Creek. The Hetch Hetchy Project was undertaken to provide water to San Francisco and the surrounding Bay Area. The project involved damming the Hetch Hetchy Valley, building a canal to convey the water across the San Joaquin Valley, and constructing the Coast Range Tunnel. The Mitchell shaft, located south of Carnegie SVRA in Mitchell Ravine, serves as an access point for the primary tunnel. Hetch Hetchy Water and Power, a department of the San Francisco Public Utilities Commission, owns and manages the shaft and properties within Mitchell Ravine (State Parks 2012:6).

2.1.2 Regional Recreation Facilities

Carnegie SVRA plays an important role in meeting the recreational needs of the local and regional community. Off-highway vehicle (OHV) recreation is a popular pastime in the region, but there are only a few OHV facilities in or near the Bay Area. The park offers interpretation of natural and cultural resources and recreation safety, and there are more opportunities to add more education and programs in the future.

Family recreating together at Carnegie SVRA.

Many parks and recreational facilities are located in the region. The facilities located in Alameda and San Joaquin counties near Carnegie SVRA range from small neighborhood parks to regional recreation facilities and wilderness areas. These parks provide opportunities for passive and active recreation such as picnic areas, sports fields, hiking and equestrian trails, and fishing and boating opportunities.



Sources: State Parks 2012, AECOM 2013 and 2023

Figure 2-1. Surrounding Land Uses

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2.1.2.1 Federal Properties

Carnegie SVRA is located near land that is controlled by several federal agencies, including the U.S. Fish and Wildlife Service (USFWS) and the National Park Service (NPS). USFWS manages the nearby San Joaquin River National Wildlife Refuge, as well as the South San Luis and Merced National Wildlife Refuges. The San Juan Bautista de Anza National Historic Trail, managed by NPS, passes between Carnegie SVRA and Livermore. Common activities in these areas include hiking, camping, and water recreation. None of the nearby federal preserves or recreation areas provide OHV recreation.

2.1.2.2 State Parks

The California State Parks System is divided into 21 Districts, each responsible for managing the State Park Units contained within their boundaries. The Diablo Range District is headquartered in Livermore and manages 21 State Park Units, including Carnegie SVRA. The Diablo Range District spans Alameda County, Sacramento County, Solano County, Contra Costa County, San Joaquin County, Stanislaus County, Santa Clara County, Monterey County, and San Benito County,

The closest SVRAs are Hollister Hills SVRA, approximately 100 miles to the south, and Prairie City SVRA, about 90 miles to the north.

2.1.2.3 Regional Parks

The East Bay Regional Park District (EBRPD) manages an extensive network of regional parks, preserves, and recreation areas in Alameda and Contra Costa counties. The District's 73 parks and more than 125,000 acres of land offer amenities such as hiking and biking trails, equestrian trails, water recreation, fishing, camping, picnicking, nature viewing, and educational programs and opportunities. No OHV opportunities are available on any of the land managed by EBRPD.

2.1.2.4 County Parks

Alameda County does not have a separate park system outside of EBRPD. No OHV opportunities are available in the San Joaquin County park system. Stanislaus County manages several small community parks, along with two regional parks with OHV facilities:

- *Frank Raines Regional Park* is located just 45 miles south of Carnegie SVRA. This facility consists of an OHV area; more than 1,000 acres of undeveloped land used for hiking, wild-boar hunting, and other nonmotorized recreation uses; and other areas with amenities for camping, picnicking, and other day-use activities. Volunteer groups and associations help to manage the park's OHV area, developing the trail system while supporting the county's conservation and environmental goals. Several motocross races are held at the park each year.
- *La Grange Regional Park* is located on more than 700 acres of land approximately 60 miles east of Tracy. The park has several historic sites and offers a diverse range of recreational opportunities including access to the Tuolumne River for boating or picnicking, a 50-acre Kiwanis Youth Camp area, and 270 acres of undeveloped wilderness area. The La Grange OHV Park within the regional park encompasses 147 acres of abandoned gold dredge area, with plans for future development of camping and picnicking areas. Local motocross associations and companies sponsor several races at the OHV park each year.

2.1.2.5 Park Districts

The Livermore Area Recreation and Park District (LARPD) is an independent recreation and park service provider for the City of Livermore and surrounding unincorporated areas. Approximately 6,000 acres of regional parkland is available to LARPD. There are no OHV parks in Livermore.

2.1.2.6 City Parks

The City of Tracy has 76 parks covering more than 270 acres. Recreation opportunities include playgrounds, ball courts, walking paths, picnic and BBQ areas, and more. There are no OHV parks in Tracy.

2.1.2.7 Private OHV Recreation Facilities

The only private facility within 50 miles of Carnegie SVRA is Club Moto in Livermore. It has an outdoor motocross track and a mini track.

2.2 Existing Carnegie SVRA Land Use and Facilities

2.2.1 Land Use

The planning area, the existing Carnegie SVRA, contains approximately 1,533 acres. The SVRA offers more than 1,300 acres of OHV recreation on rolling hills and in steep, rugged canyons. Recreation uses within SVRA include hillclimbs, challenge areas, camping, tracks, and OHV trails. There are day-use areas and a concession store (MotoMart). Some areas are closed to use, including the Waterfall Canyon area and portions of the floodplain of Corral Hollow Creek.

2.2.2 Circulation and Access

The Carnegie SVRA ranger station is located near the main entrance, along with a first-aid facility, office, and parking lot. A concessions store is located approximately 0.1 mile east of the ranger station. Gates along Tesla Road and Corral Hollow Road provide restricted access to the SVRA but are locked to prevent unauthorized access (State Parks 2014).

Visitors enter the SVRA from Corral Hollow Road.

Vehicle access to Carnegie SVRA is through the main entrance on Tesla Road/Corral Hollow Road. Called Tesla Road in Alameda County and Corral Hollow Road in San Joaquin County, this two-lane rural road runs between South Livermore Avenue in Livermore and the city of Tracy and is a popular commute route between Tracy and the Bay Area. This road provides the only access to the SVRA for vehicles. Private vehicles are the only way to access Carnegie SVRA; no transit or shuttle service is available in the immediate area. Based on survey results, the median distance traveled to Carnegie SVRA was 31 miles, but 76 percent of respondents said they live less than 50 miles from the SVRA. Many visitors also traveled from parts of southern California and outside of the state (KD Anderson & Associates 2012).

View of campground from hillside trails.

A 2012 traffic study found that essentially no congestion occurs on Saturday afternoons and most surrounding intersections experience a level of service (LOS) of "A." LOS is a qualitative measurement of the operating conditions of transportation systems. LOS is typically used to indicate how well traffic is flowing on a particular roadway. LOS A, the highest rating, indicates free-flowing traffic with no stops. LOS F, the lowest rating, indicates that traffic is slowed to a halt.

Weekday-afternoon peak traffic levels at the studied intersections were also generally acceptable. Most intersections received a rating of LOS C or better. One nearby intersection, the northbound approach at the Altamont Pass Road/westbound I-580 intersection, received a rating of LOS F. This intersection, which is a freeway off-ramp, would be unlikely to affect park attendees, except those living near North Vasco Road in Livermore (KD Anderson & Associates 2012).

No alternative modes of transportation, such as bus, rail, bicycle, or pedestrian facilities, are available in the area. Because OHVs, except for highway-licensed trucks, jeeps, and dual-sport motorcycles, are typically transported to recreational areas by a highway-licensed vehicle, the use of alternative transportation options is limited.

Because of the frequency of accidents (95 incidents in a 5-year period), Alameda County's Public Works Agency has completed a safety study of Tesla Road between Livermore and the San Joaquin County line. The Tesla Road Safety Study, completed in May 2015, identifies potential future safety improvements to the roadway, but includes no widening or capacity improvements.

2.2.3 Facilities

2.2.3.1 Visitor Facilities

Visitor facilities include multiple restrooms scattered throughout the SVRA, day-use sites for picnicking and staging, and the following recreational facilities:

- *OHV Trails*—Available for a range of skill levels; main trails are marked by the level of difficulty. Off-highway motorcycles are allowed on all trails. Most trails are multi-use, but some trails are not wide enough for all-terrain vehicles (ATVs).
- *Motocross Track*—Open to off-highway motorcycles only. Formalized competitive events are held on some weekends, causing the track to be closed to the public periodically.
- *ATV/Motocross Track*—Open to both ATVs and off-highway motorcycles.
- *70cc Children's Track*—Available for off-highway motorcycles and ATVs with small engines up to 70cc displacement. This track offers young riders an opportunity to practice and improve their riding skills.
- *110cc Beginner Track*—Available for off-highway motorcycles and ATVs with small engines up to 110cc displacement.
- *4x4 Challenge Area*—Open to four-wheel-drive (4WD) vehicles only. The area is not currently available to trials bikes.

- *Hillclimb Special Event Area*—Open to off-highway motorcycles. This area is closed to the public except during formal hillclimb events several weekends a year.
- *Campsites*—Provided for those looking to camp with or without a trailer (26 sites). Most sites have a shade structure, fire ring, and picnic table.
- *Park Concession*—Provides SVRA visitors access to purchase off-highway motorcycles and ATV parts, safety gear, and OHV accessories. Food service and minor OHV repair service are also available.

2.2.3.2 Operations Facilities

Existing administration and maintenance facilities include an entrance station, the maintenance yard, and the Carnegie SVRA office. The entrance station contains a small entry kiosk; the ranger station, which includes a small locker room and office area; and a staff-only restroom. The maintenance yard occupies approximately 1.5 acres and includes a repair shop, material utility sheds, a butler storage shed, and a shelter. Maintenance staff members use a small office area in the shop as their primary work location and work breakroom/lunchroom. The Carnegie SVRA office is located north of Corral Hollow Road, across from the campground, and contains a team meeting space, shared kitchen, and offices for Carnegie SVRA staff.

Sign listing the facilities at Carnegie SVRA.

Rider beginning ascent during a hillclimb competition.

2.2.3.3 Utilities

Electricity

Pacific Gas and Electric Company (PG&E) provides electrical service to the planning area (PG&E 2013). A PG&E transmission line runs north to south near the planning area, approximately 1 mile west of the Alameda/San Joaquin County line. The 500-kilovolt transmission line (called the Tesla Metcalf Line) runs from the Tesla Power Substation in Tracy to Moss Landing.

An aboveground transmission line owned by the San Francisco Public Utilities Commission and maintained by its Hetch Hetchy Water and Power (HHWP) subgroup crosses the planning area. The line parallels Tesla Road/Corral Hollow Road through Carnegie SVRA and continues westward. The transmission line originates at the Kirkwood, Holm, and Moccasin Powerhouses located in Stanislaus National Forest and terminates in San Francisco. The transmission line is supported by large steel-trussed towers typically spaced 500–2,000 feet apart. HHWP maintains a 200-foot right-of-way easement along the lines. Before the start of any maintenance or improvement projects that encroach into HHWP's right-of-way, the Bay Area office of the California Bureau of Real Estate would be notified, and plans would be submitted to HHWP for approval (State Parks 2007a:38).

Figure 2-2 depicts the locations of the existing electrical lines and easement in the planning area and vicinity.

Telecommunications

An underground AT&T cable parallels SRI Road. The cable supplies properties southeast of Carnegie SVRA with telecommunications services. Markers along the roadway identify the cable alignment (Figure 2-2) (State Parks 2007a:38). Telephone, Internet, and cable services are provided through a contract with AT&T. Aboveground cables supported by utility poles bring these services to Carnegie SVRA. The primary communication cable system parallels Corral Hollow Road/Tesla Road, with secondary cables branching off at individual residences and facilities.

Water Delivery, Wastewater Treatment, and Stormwater

A well and water treatment plant supply water to Carnegie SVRA. The plant is north of Corral Hollow Road, near the Carnegie SVRA office (Figure 2-1). The potable-water well that serves the SVRA produces roughly 20 gallons per minute. The average use per year is 5.9 million gallons. This well produces potable water for public consumption and facilities. A non-potable water well (not usable by public facilities) is used for functions such as irrigation and dust suppression. This well produces 45 gallons per minute, with average use of 8.4 million gallons per year. Eight wells supply water to state residences, but they are shallow and only produce enough water for the building into which they are tied. Water mains distribute water from the treatment plant to points throughout the SVRA.

No permanent sewer system exists at Carnegie SVRA. All wastewater at the SVRA is disposed of through septic tanks with leach lines, or through chemical or vault toilets that are pumped out for off-site disposal.

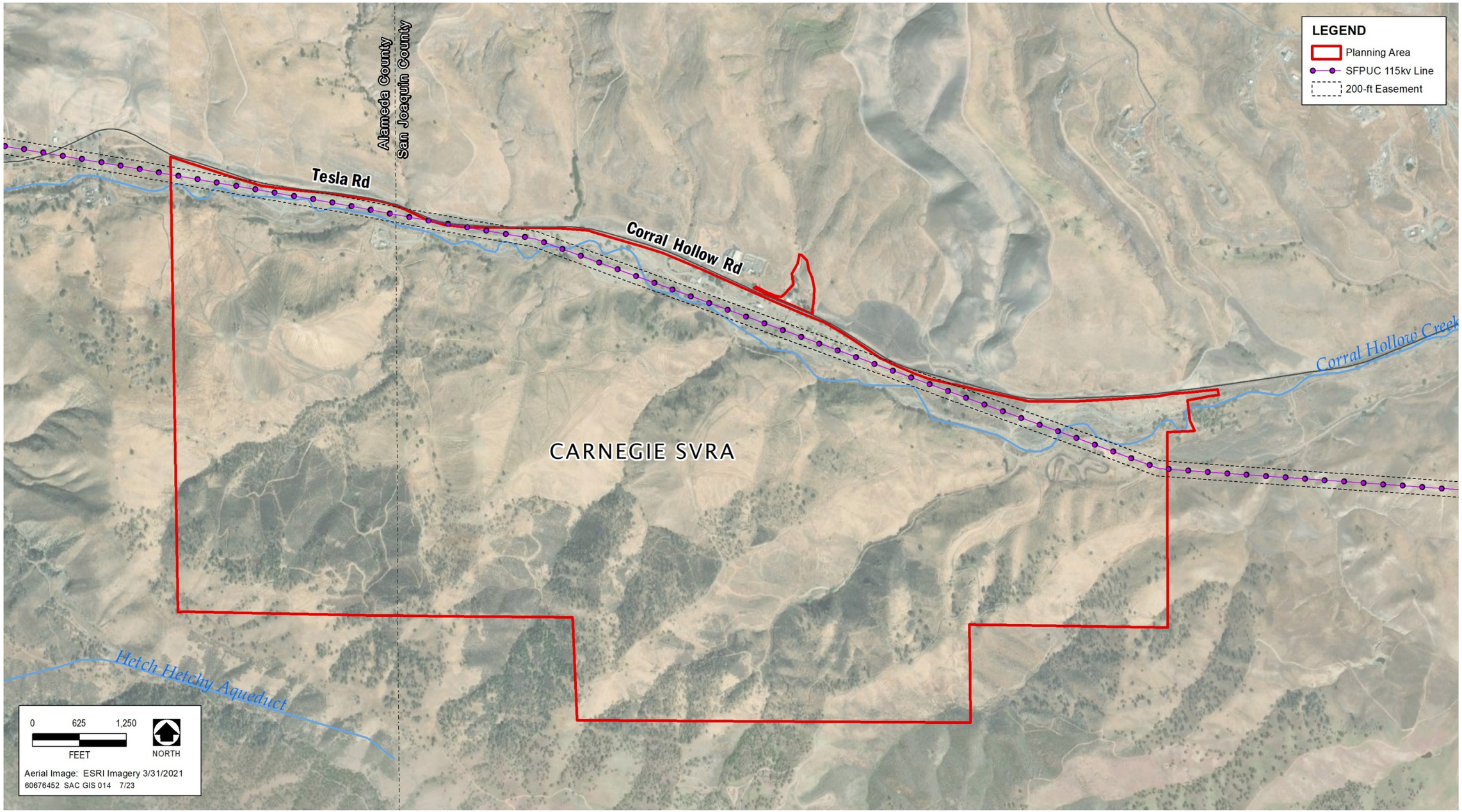
The State Parks Off-Highway Motor Vehicle Recreation (OHMVR) Division initiated a study of the Corral Hollow watershed in 2004. The primary goal of the assessment was to provide State Parks, Carnegie SVRA staff members, and community stakeholders with an understanding of historical occurrences that have shaped the watershed. Based on the assessment's findings, State Parks developed recommendations to reduce future erosion and sediment concerns and return Corral Hollow to a properly functioning watershed, while maintaining visitor satisfaction and preserving the area's historic value. These conclusions and recommendations are presented in the *Final Corral Hollow Watershed Assessment* (State Parks 2007a:1–4).

Wattles were placed on a hillside as a step toward rehabilitating the vegetation.

To address the erosion and sediment impacts of SVRA activities, State Parks has implemented best management practices (BMPs) throughout Carnegie SVRA. These BMPs consist of the use of a variety of methods: placement of erosion control blankets, seed, mulch, and fiber rolls; gully rehabilitation; exclusion fencing from the creek; increased plant cover and riparian restoration in the creek floodplain; application of dust suppressants; removal of accumulated sediment from sediment basins and culverts; and construction of low-water crossings and bridges. State Parks has also prepared an OHV-specific BMP manual that SVRA staff members can use to select and implement proper BMPs when designing future trails and roadways and maintaining existing trails and roads. State Parks has also implemented road improvements, improved trail design, reduced open trail riding and trail density, wet season trail condition monitoring and closures, and reduced off-trail riding, which have made significant progress in storm water protection and water quality. The intent of implementing these recommendations is to ensure that the lands managed by State Parks will meet the water quality criteria set by the National Pollutant Discharge Elimination System (NPDES) and Clean Water Act (CWA), continue to provide recreational opportunities, preserve natural and cultural resources, and provide additional opportunities for interpretation.

Corral Hollow Creek flows intermittently during rainy winter months.

Carnegie SVRA staff members implement the *Storm Water Management Plan for Carnegie SVRA* (SWMP) (State Parks 2012). The findings from the *Corral Hollow Watershed Assessment* (State Parks 2007a) were used to develop recommendations for innovative BMPs to reduce erosion and sediment issues, and to create an active adaptive management framework to meet water quality objectives. This framework includes continual assessment of erosion and sediment generators, implementation of appropriate BMPs, ongoing monitoring and evaluation of these actions, and plans for long-term maintenance to ensure that these actions are successful. The SWMP is described in detail in Section 2.7.3, “Regulatory Influences.”



Sources: State Parks 2016

Figure 2-2. Electrical Lines in the Planning Area and Vicinity

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Following these recommendations will also help to ensure that Corral Hollow Creek will be rehabilitated to a proper functioning condition. Proper functioning condition relates to the creek's ability to convey floodwaters, maintain water quality, transport natural stream sediments, and provide a riparian corridor that maximizes the opportunities for wildlife and aquatic habitat (State Parks 2007a:170).

Solid Waste

Solid waste generated at Carnegie SVRA is transported by Delta Disposal Service Company to the Tracy Material Recovery and Transfer Station, located at 30703 South MacArthur Drive in Tracy. The solid waste is then transported to the San Joaquin County–owned Foothill Sanitary Landfill, located at 6484 North Waverly Road in the community of Linden. This is the largest landfill in San Joaquin County and, based on its current permit, is projected to be in operation until 2082.

2.3 Resource Values

2.3.1 Physical Resources

2.3.1.1 Topography

The topography at Carnegie SVRA varies widely, ranging from approximately 600 feet above mean sea level along the eastern portion of Corral Hollow Creek (near the eastern boundary of the planning area) to approximately 1,700 feet above mean sea level along the southern border of the SVRA. Generally, hills with moderate to steep slopes trend down into narrow valleys, and slope down to more gently sloping and flat land along Corral Hollow Creek. Rock outcroppings are present in many locations throughout the planning area.

Hills slope up from the Corral Hollow Creek floodplain

2.3.1.2 Geology, Soils, Minerals, and Paleontological Resources

Geology

Regional Geology

The planning area is located in the Coast Range Geomorphic Province, which is characterized by northwest-southeast trending ridges separated by parallel river valleys. The Coast Ranges were created by folds and faults that resulted from the collision of the Pacific and North American Plates and subsequent strike-slip faulting along the San Andreas Fault zone.

More specifically, the planning area is located within the Diablo Range, a prominent mountain range extending approximately 180 miles from Mt. Diablo in the north to Cholame in the south. Average elevations in the Diablo Range are 2,000–3,000 feet above mean sea level. The Diablo Range generally consists of rolling grassland and plateaus, with occasional peaks. Boundaries between ridges and valleys are often defined by faults, which separate rocks that are more resistant to weathering and landslides, from weaker rocks.

Rocks in the Diablo Range consist primarily of metamorphic and igneous rocks associated with the Franciscan Complex (described in more detail below in the "Local Geology" section). These rocks are adjacent to, and locally overlain tectonically by, sequences of oceanic crustal and marine sedimentary rocks of late Mesozoic through Tertiary ages. (See the abbreviated geologic time scale shown in Table 2-1). Regional geology is controlled by faults and folds from older inactive and more recent active fault zones.

Local Geology

The planning area is located within the U.S. Geological Survey (USGS) Cedar Mountain, and Midway 7.5-minute quadrangles. As described previously in the "Topography" section, the area's topography ranges from approximately 600 to 1,700 feet above mean sea level; hills with moderate to steep slopes yield to more gently sloping and flat land along Corral Hollow Creek, and rock outcroppings are present.

Based on descriptions provided by Throckmorton (1988) and Carpenter et al. (1984:35), rock formations in the vicinity of the planning area range in age from Jurassic to upper Miocene (see Table 2-1 for a geologic time scale) and are found within a complex structure of faults and folds. The structure of the rock formations is as follows, from bottom to top:

Table 2-1. Abbreviated Geologic Time Scale

Era	Period	Epoch	Age (million years before present)
Cenozoic	Quaternary	Holocene	0.117 (=11,700)
Cenozoic	Quaternary	Pleistocene	2.6 to 0.117
Cenozoic	Tertiary	Pliocene	5.3 to 2.6
Cenozoic	Tertiary	Miocene	23 to 5.3
Cenozoic	Tertiary	Oligocene	33.9 to 23
Cenozoic	Tertiary	Eocene	55.8 to 33.9
Cenozoic	Tertiary	Paleocene	65.5 to 55.8
Mesozoic	Cretaceous	Upper	99.6 to 65.5
Mesozoic	Cretaceous	Lower	145.5 to 99.6
Mesozoic	Jurassic	Upper	161.2 to 145.5
Mesozoic	Jurassic	Middle	175.6 to 161.2
Mesozoic	Jurassic	Lower	199.6 to 175.6
Mesozoic	Triassic	Upper	228.7 to 199.6
Mesozoic	Triassic	Middle	245.9 to 228.7
Mesozoic	Triassic	Lower	251 to 245.9
Paleozoic	--	--	542 to 251
Precambrian	--	--	4,000 to 542

Note: Numbers have been rounded.
Source: UCMP 2011, adapted by AECOM in 2013.

- The oldest rocks, which make up the Jurassic- and Cretaceous-age Franciscan Complex, consist primarily of graywackes, shales, and cherts that have been faulted against mudstones and shales of the upper Jurassic Knoxville and Cretaceous Panoche Formations.
- Overlying the Knoxville Formation are marine shales, sandstones, and siltstones of the upper Cretaceous Moreno Formation.
- Overlying the Moreno Formation are sandstones of the middle Eocene/upper Paleocene Tesla Formation.
- The Miocene Cierbo Sandstone (part of the San Pablo Group) unconformably overlies the Tesla Formation.

- Nonmarine sandstones and siltstones of the Neroly Formation (part of the San Pablo Group) overlie the Cierbo Sandstone.

A review of the *Geologic Map of the San Francisco–San Jose Quadrangle* (Wagner et al. 1991) indicates that the planning area is composed of a variety of geologic formations as described below (Figure 2-3):

- **Quaternary alluvium**—Holocene-age deposits composed of unconsolidated stream and basin deposits from clay to boulder size.
- **Contra Costa Group**—late Miocene–age nonmarine deposits composed of sandstone, conglomerate, shale, and minor amounts of claystone, limestone, and tuff. The Contra Costa Group includes the Orinda and Moraga Formations.
- **San Pablo Group**—late Miocene–age marine deposits composed of sandstone, mudstone, siltstone, and shale with minor amounts of tuff. The San Pablo Group includes the Neroly Sandstone, Cierbo Sandstone, and Briones Sandstone Formations.
- **Tesla Formation**—late Eocene– and early Paleocene–age deposits composed of quartzose sandstone interbedded with siltstone, mudstone, and carbonaceous shales. The Tesla Formation includes the Laguna Seca Formation.
- **Moreno Formation**—Cretaceous-age marine deposits composed of shale and sandstone.
- **Panoche Formation**—Cretaceous-age marine deposits composed of shale, siltstone, and sandstone.
- **Franciscan Complex Mélange Terrane**—a chaotic mixture of Jurassic- and Cretaceous-age fragmented rock masses in a sheared matrix. Coherent masses large enough to be shown on geologic maps consist of sandstone, shale, limestone, chert, greenstone, serpentinized ultramafic rocks, and metagraywacke.
- **Franciscan Complex Chert**—the Jurassic- to Cretaceous-age chert member of the Franciscan Complex. Most of the chert in the Franciscan Complex consists of fine-grained, hard, highly siliceous rocks. Most have a high iron oxide or hydroxide content and thus are red, reddish, brown, or green. Many of the Franciscan chert outcrops are interbedded with shale. About 10 percent of the chert in the Franciscan Complex consists of the skeletons of tiny marine organisms called radiolaria (Bailey et al. 1964:55–65).

Regional Seismicity and Fault Zones

Potential seismic hazards resulting from a nearby moderate to major earthquake generally can be classified as primary or secondary. The primary effect is fault ground rupture, also called surface faulting. Common secondary seismic hazards are ground shaking, liquefaction, and subsidence. Each of these potential hazards is discussed below.

Fault Ground Rupture

Surface rupture is the actual cracking or breaking of the ground along a fault during an earthquake. Structures built over an active fault can be torn apart if the ground ruptures. Surface ground rupture along a fault generally is limited to a linear zone a few yards wide. The Alquist-Priolo Earthquake Fault Zoning Act was enacted to prohibit structures designed for human occupancy from being built across the traces of active faults, and thus to reduce the loss of life and property from an earthquake. The Greenville Fault is the closest fault to the planning area and is located approximately 3 miles west of the area (Figure 2-4). This fault is located within an Alquist-Priolo Earthquake Fault Zone (California Department of Conservation 2021).

Seismic Ground Shaking

Ground shaking is the motion that occurs as energy is released during faulting and has the potential to result in damage to or collapse of buildings, and to cause landslides, subsidence, liquefaction, or seiches. The effects of ground shaking depend on the magnitude of the earthquake, location of the epicenter, character and duration of the ground motion, and type of soil and/or rock formation.

Faults in the Project Region

Seven major active faults extend through the San Francisco Bay region in a northwesterly direction and have produced at least 12 large-magnitude (greater than 6.0) earthquakes in the last 200 years. The faults on which these earthquakes occurred are part of a fault system located along the boundary of the Pacific oceanic plate and the North American continental plate. The two plates are sliding past one another, forming a transform boundary.

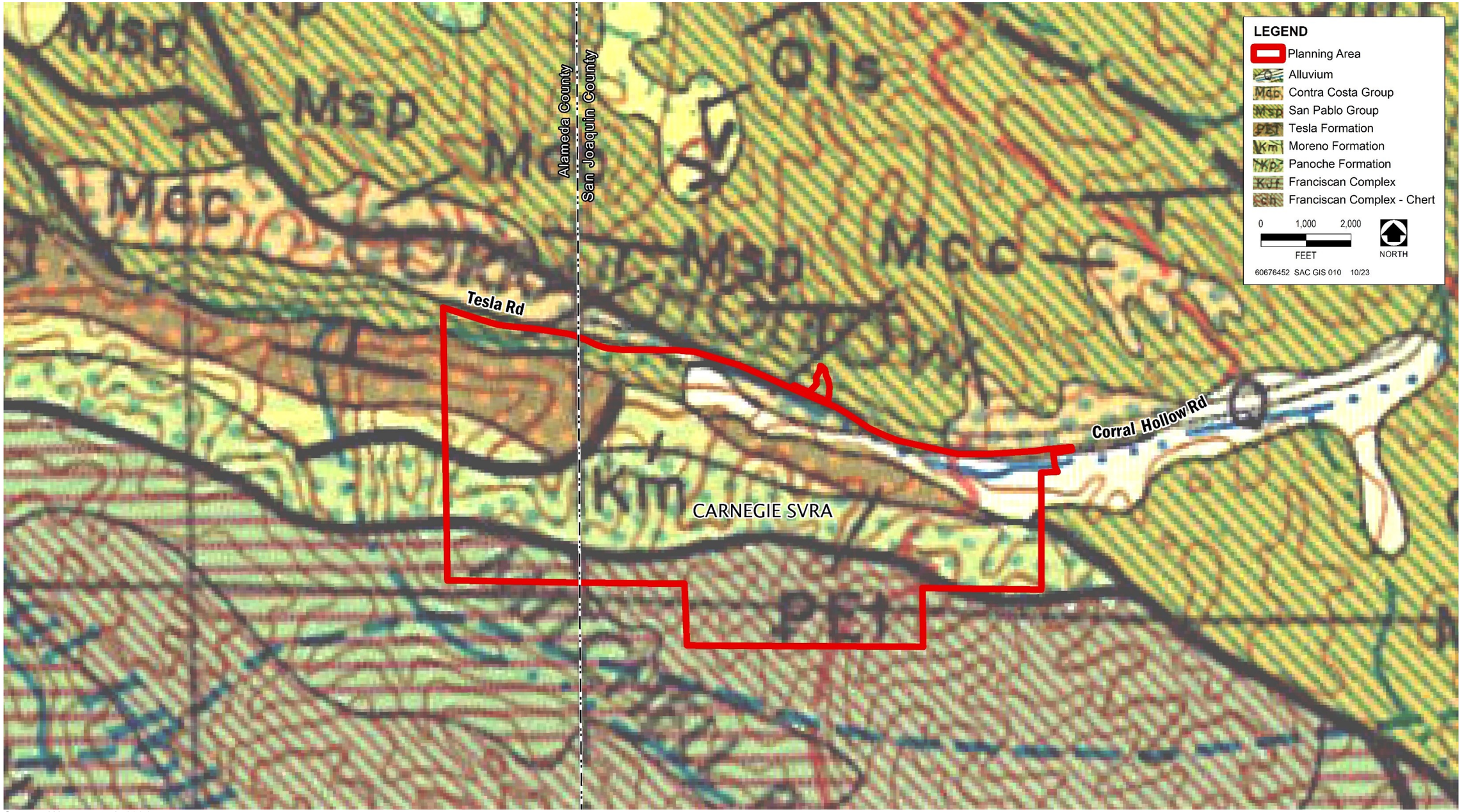
The Greenville Fault, which is active and is considered by the Working Group on California Earthquake Probabilities (2003) to be one of the seven major faults in the San Francisco Bay Area, is located 3 miles west of the planning area. Table 2-2 identifies the major regional faults, their approximate distances from the planning area, and the estimated maximum moment magnitude and slip rate of reach fault. A brief summary of pertinent fault data is also provided, along with additional information regarding local faults.

Table 2-2. Major Faults in the Project Region

Fault Name	Approximate Distance from Project Site (miles)	Maximum Moment Magnitude (Mw)	Slip Rate (mm/yr)	Fault Data
Greenville	3	6.9	2.0	Dextral strike-slip fault that extends from the eastern flank of Mt. Diablo south to the San Antonio Valley, with an estimated length of 14–38 miles. Two historic earthquakes measuring M 5.8 and 5.4 occurred in 1980 in the Livermore Valley.
Calaveras	20	6.92	6.0	Dextral strike-slip fault linked to the San Andreas Fault zone along the subparallel Paicines Fault. Composed of numerous strands that form a zone 30–1,600 feet wide. Fault zone extends from the San Ramon Valley southeast to approximately 19 miles south of Hollister. Historic earthquakes measuring Mw 5.8, 5.8, and 6.3, respectively, occurred in 1861 in the San Ramon Valley, in 1979 at Coyote Lake, and in 1984 at Morgan Hill.
Hayward–Rodgers Creek	25	7.26	9.0	Dextral strike-slip faults that extend from near Healdsburg 86 miles south to Fremont. The Rodgers Creek Fault extends from Healdsburg to a 3-mile-wide zone underneath San Pablo Bay. A 3.7-mile-wide stepover occurs from the southern end of the Rodgers Creek Fault to the northern end of the Hayward Fault. One historic earthquake measuring M 6.8 occurred in 1868.
San Andreas	40	7.9	17.0	Dextral strike-slip fault divided into four segments for a total length of approximately 293 miles, from the northern end of the 1906 earthquake to San Juan Bautista. Historic earthquakes with M greater than 6.7 occurred in 1838, 1906, and 1989.
Concord–Green Valley	55	6.71	4.0 to 5.0	Dextral strike-slip fault that extends from Walnut Creek 34 miles north to Wooden Valley. The Concord portion of the fault begins at a 5-degree change in fault strike beneath Suisun Bay and ends in the intersection with the Mt. Diablo blind-thrust fault. One historic earthquake with a surface wave magnitude of 5.4 occurred in 1955.
San Gregorio	60	7.4	7.0	Dextral and reverse segments. Begins offshore of the Golden Gate Bridge at the intersection with San Andreas Fault and follows the western edge of the San Francisco Peninsula to the south end of Monterey Bay, for a total length of approximately 108 miles. Much of the fault is offshore. Two historic earthquakes measuring M 6.1 occurred in 1926.

Notes: M = moment magnitude; mm/yr = millimeters per year; Mw = maximum moment magnitude

Sources: Working Group on California Earthquake Probabilities 2003; Wills et al. 2008; data compiled by AECOM in 2013 and 2023



Source: Wagner et al. 1991

Figure 2-3. Geologic Formations in the Planning Area

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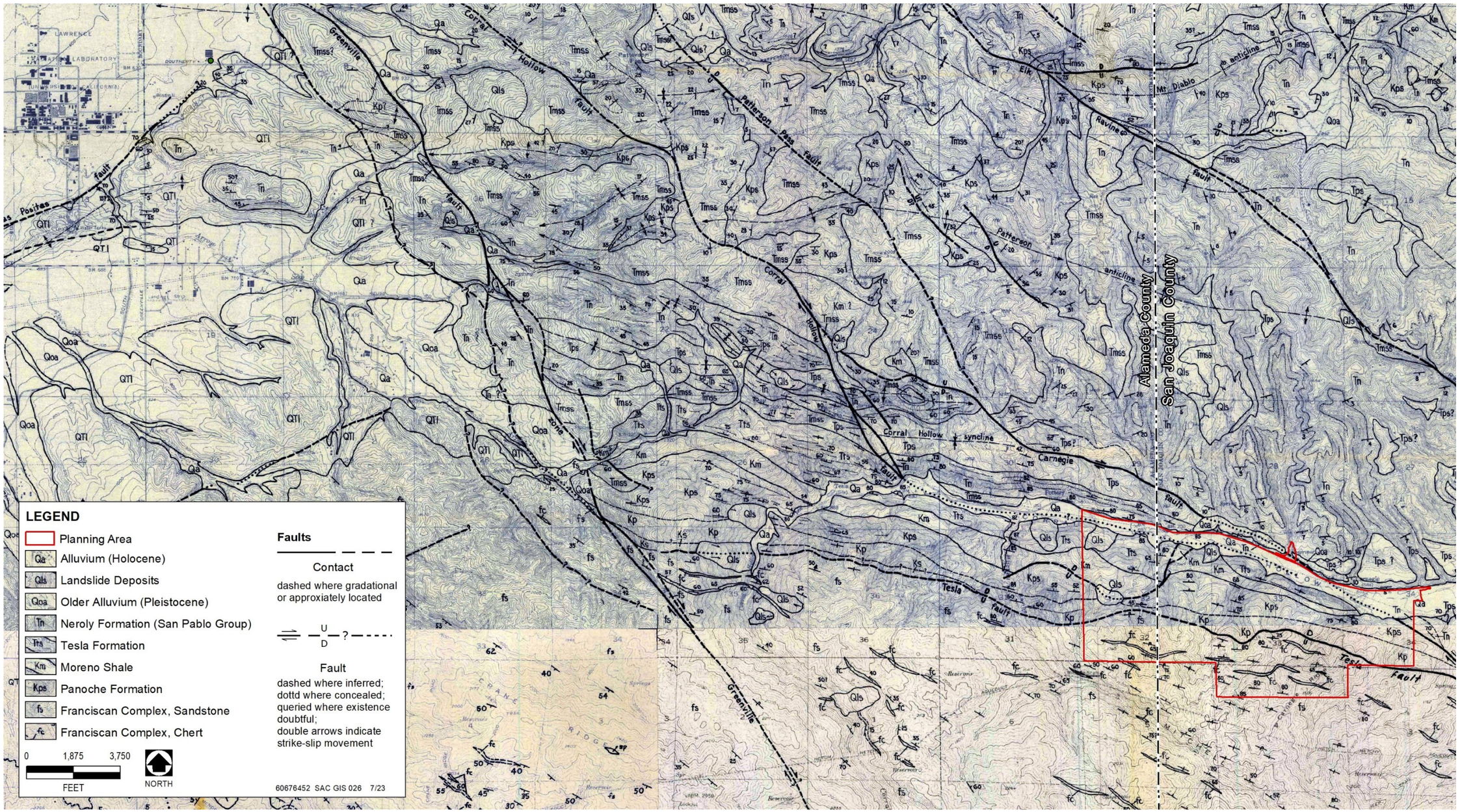

Sources: Dibblee 1980a, 1980b, 1980c, and 1980d

Figure 2-4. Faults in the Planning Area Vicinity

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Numerous studies of the Greenville Fault and other smaller faults have been conducted over the last 30 years. The report *Geology of the Lawrence Livermore National Laboratory Site and Adjacent Areas* (Carpenter et al. 1984) is particularly relevant because of its detailed examination of the geology in the vicinity of the planning area. Figure 2-5 shows the locations of the Greenville Fault and the smaller Las Positas, Corral Hollow, Tesla, Carnegie, and Patterson Pass Faults. The following brief descriptions of these faults are based on investigations either conducted by or summarized in Carpenter et al. (1984:43–66).

- **Las Positas Fault**—Evidence of displacement of geologic formations along the Las Positas Fault trace indicates that movement occurred along this strike-slip fault as recently as 3,000–80,000 years Before Present (B.P.). The Las Positas Fault, located approximately 5.2 miles northwest of the planning area, consists of two branches that intersect the Greenville Fault. Both branches appear to exist as shear zones that are several hundred feet wide. Geologic evidence suggests that the 1980 earthquakes along the Greenville Fault may have initiated seismic slip along both branches of the Las Positas Fault. Further geologic evidence indicates that the Las Positas Fault has ruptured to the surface during historic time (i.e., within the last 200 years). Microearthquakes (2.0 or less in magnitude) and one magnitude 3.2 event have been recorded along the south branch of this fault zone. Therefore, the Las Positas Fault is considered active, and its northern branch is included in an Alquist-Priolo Earthquake Fault Zone. The Las Positas Fault has an estimated slip rate of 0.4 millimeter per year and maximum magnitude of 6.0.
- **Corral Hollow Fault**—A portion of the Corral Hollow Fault is located within the SVRA, along the bed of Corral Hollow Creek. The Corral Hollow Fault is a northwest-trending strike-slip fault that is oriented subparallel to segments of the Tesla and Greenville Fault zones. The Corral Hollow Fault is located northeast of the Greenville Fault zone and trends southeast toward Corral Hollow, and then easterly beneath alluvium in Corral Hollow to an inferred junction with the Carnegie Fault. Although this fault has not been classified as “active” by the California Geological Survey and is not zoned under the Alquist-Priolo Act, evidence has been presented to State Parks that trenching conducted in 1990 in northeast Section 33, Township 3 South, Range 3 East showed that Holocene gravel deposits overlying the Tesla Formation had been offset downward on the south side of the fault. This evidence indicates that the Corral Hollow Fault may be active.
- **Tesla Fault**—A portion of the Tesla Fault is located within the SVRA south of Corral Hollow Creek. The Tesla Fault is the northernmost segment of a complex of faults of varying ages along the eastern flank of the Diablo Range. These faults are likely remnants of the older Coast Range Thrust Fault System, a regional system that originally separated the subducted oceanic crust and sedimentary rock of the Franciscan Complex from the structurally overlying ophiolite and sedimentary rock of the Great Valley sequence. Geologic studies have confirmed that the southern segment of the Tesla Fault is truncated by the Greenville Fault west of the planning area; the western portion of the Tesla Fault has been displaced approximately 4.6 miles northwest as a result of movement along the Greenville Fault. Earthquake epicenters have been reported near the Tesla Fault in the vicinity of the planning area, but geologic studies have not encountered evidence of surface faulting.
- **Carnegie Fault**—The Carnegie Fault trends northwest to southeast in the project vicinity. The southeastern portion of the Carnegie Fault is located within the SVRA, north of Corral Hollow Creek. This is a local fault related to a complex zone of folding and faulting northwest of the Tesla Fault. Geologic evidence suggests that fault activity along the northwestern portion of the fault (outside of the planning area) has not occurred since the Pliocene epoch. Therefore, this portion of the Carnegie Fault is not considered active. However, Jennings (1994) indicates that the southeastern portion of the Carnegie Fault shows evidence of activity during the Holocene based on an updated geologic study prepared in 1991 for the adjacent Lawrence Livermore Laboratory Site 300. Therefore, this portion of the Carnegie Fault (within the planning area) is considered active.
- **Patterson Pass Fault**—The Patterson Pass Fault branches from the Carnegie Fault northwest of the planning area and may extend northwest for approximately 8 miles to an inferred convergence with the Greenville Fault. Both the Patterson Pass and Greenville Faults show pronounced horizontal components of movement and steep dips but are upthrown on opposite sides. Because of its possible

linkage with the Greenville Fault and reported seismic activity along its trace, the Patterson Pass Fault has been considered active by some researchers. However, other investigations of this fault have shown it to be only approximately 4.6 miles long, with no definitive connection to the Greenville Fault.

Landslides

A landslide is the downhill movement of masses of earth material under the force of gravity. Steep slopes, unstable terrain, proximity to earthquake faults, and rainfall all contribute to landslide potential. Landsliding typically involves the surface soil and an upper portion of the underlying bedrock. Movement may be very rapid, or so slow that a change of position can be noted only over a period of weeks or years. (This slow change is known as "creep.") Known landslides in the San Joaquin County portion of the planning area are shown in Figure 2-4 (labelled as "Qls"); landslides in the Alameda County portion of the planning area are shown in Figure 2-5.

Nilsen (1972) conducted a landslide analysis within the Alameda County portion of the SVRA by analyzing aerial photographs. The results of Nilsen's analysis indicated that most of the planning area that is within Alameda County consists of small to large landslides. A large landslide deposit is also located just east of the Alameda County portion of the SVRA, within San Joaquin County, south of Corral Hollow Creek (Dibblee 1980a). Nilsen confirmed that the larger slides were older and deep-seated; however, the smaller slides could be recent, shallow failures. Younger, shallower landslides have a greater potential to be reactivated by changes in watershed hydrology, stream erosion, or seismically induced ground shaking, among other causes.

Liquefaction

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. The factors that determine liquefaction potential are the soil type, distance from an active seismic source, intensity and duration of seismic ground motions, and depth to groundwater. Loose sands, peat deposits, and uncompacted fill and other water-saturated Holocene deposits within 40 feet of the ground surface are the most susceptible to liquefaction. Liquefaction poses a hazard to engineered structures such as bridges, roads, and buildings, and to underground utility pipelines. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on retaining walls, and slope instability.

Seismic Seiches

Earthquakes may affect open bodies of water by creating seismic sea waves and seiches. Seismic sea waves (often called "tidal waves") are caused by abrupt, usually vertical ground movements on the ocean floor in connection with a major earthquake. Because of the planning area's long distance from the Pacific Ocean and the intervening mountainous topography, seismic sea waves are not a factor to consider during future planning and development at Carnegie SVRA.

A seiche is a sloshing of water in an enclosed or restricted water body, such as a basin, river, or lake, that is caused by earthquake motion. The sloshing can occur for a few minutes or several hours. No bodies of water that are large enough for destructive seiche action to occur are located either within or adjacent to the planning area.

Source: Nilsen 1972

Figure 2-5. Landslides in the Alameda County Portion of the Planning Area

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Soils

Figure 2-6 shows the locations of the various soil types present in the planning area. Table 2-3 summarizes relevant general characteristics of these soils.

Erosion

As shown in Table 2-3 data from soil surveys conducted by the U.S. Natural Resources Conservation Service (NRCS 2022) indicate that most soils in the planning area have relatively low susceptibility to wind erosion, but also have high runoff rates and are susceptible to water erosion. NRCS has rated nearly all soils in the planning area with either a severe or very severe off-trail erosion hazard. However, as noted in the Corral Hollow Watershed Assessment (State Parks 2007a:67):

> The hazard classification system ranges from slight to very severe and is based on soil properties that influence erodibility, vegetation establishment, and dust mobilization potential.
>
> The system assumes that the trails were not compacted or surfaced, and that all vegetation was removed. It does not account for trail management and construction techniques that have been or will be imposed at the existing Carnegie SVRA. This hazard rating system is only intended to present the erodibility potential of the trails and should be interpreted cautiously as it represents a worst-case scenario.

Expansive Soils

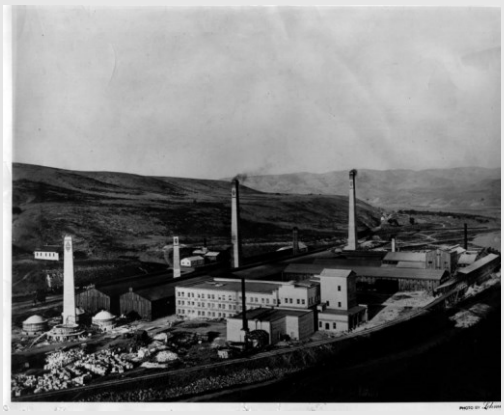
Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water and shrink when dried. Because of this effect, structural foundations may rise during the rainy season and fall during the dry season. If this expansive movement varies beneath different parts of a structure, the foundation may crack, and portions of the structure may become distorted. Retaining walls and underground utilities may be damaged for the same reasons. Most of the soil types in the planning area have a moderate to high shrink-swell potential with high clay content (Table 2-3). Because the soils have high clay content, they are likely to undergo substantial volume changes as soil moisture content increases or decreases.

Soil Limitations for Septic Systems

For a conventional septic system to function properly, soils must percolate (or “perc”) appropriately—that is, a certain volume of water must flow through the soil in a certain time period, as determined by a licensed civil or geotechnical engineer. Wastewater is “treated” as soil bacteria feed on the waste material, and in the process, break down the material into more basic elements that are dispersed into the lower layers of the soil horizon. If wastewater percolates through the soil too quickly, the bacteria will not have enough time to digest the material. On the other hand, if wastewater percolates through the soil too slowly, the bacteria are killed by the lack of oxygen. Most of the soils in the planning area consist of a shallow layer of silt, sand, or clay, underlain by bedrock. Based on a review of NRCS soil data (Table 2-3), the soils in the planning area are unsuitable for conventional septic systems.

Minerals and Mineral Resources

As discussed in detail in the *Corral Hollow Watershed Assessment* (State Parks 2007a:28–33), coal, clay, gravel, lime, manganese, and sand were mined in and adjacent to the planning area from 1855 to 1960. Several coal mining companies explored, mined, and transported coal within Corral Hollow in a variety of locations, most notably from the Tesla Coal Mine.

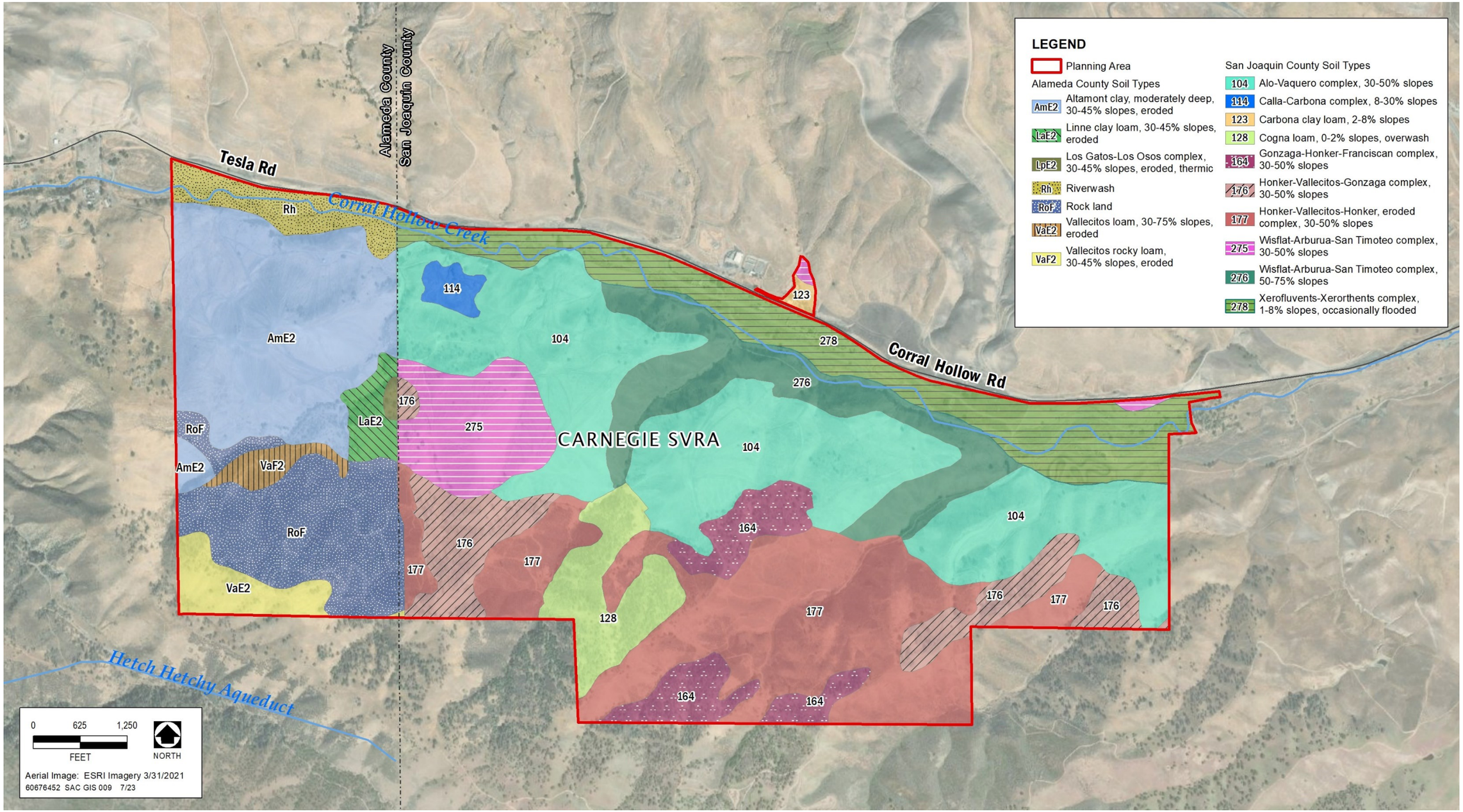


In the late 1800s and early 1900s, the Carnegie Pottery Plant made bricks and other products using clay mined nearby, State Parks' Earle Williams Collection (Acc. No. 095-P79645)

Four different companies mined gravel from the bed of Corral Hollow Creek near the mouth of Corral Hollow and at the former townsite of Carnegie. Gravel mining operations began in 1895, reached their peak from 1901 to 1911, and ceased in 1947. A limestone quarry approximately 225 long and 40 feet deep was excavated for use in cement. Lime was mined from 1901 to 1904. Mining for manganese began in 1863, at a site located approximately 1 mile southeast of the planning area and continued until 1922. A clean bed of sand containing 75 percent quartz and 25 percent clay was encountered by coal miners in the Tesla Number 3 Tunnel in 1890. From 1902 to 1908, the sand was processed into window glass. Intermittent mining of sand for various uses continued until 1960. The extensive mining activities led to the formation of a number of waste rock piles located along Corral Hollow Creek approximately 1.5 miles upstream of the SVRA. The historic mining activities also promoted the construction of several townsites including Tesla and Carnegie. For additional details, see Section 2.3.3, "Cultural Resources."

Mine waste rock north of Corral Hollow

As discussed above in the "Local Geology" section, portions of the planning area are composed of Franciscan Complex chert. Chert can be used as a road-base material, is the host rock for all productive manganese deposits in the Franciscan Complex and is a prominent component of stream gravels used for concrete aggregate.



Source: Soil Survey Geographic Database 2019

Figure 2-6. Soil Types in the Planning Area

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Table 2-3. Alameda and San Joaquin County Soil Types Found within the Planning Area

Soil Map Unit Name	Surface Texture	Depth to Bedrock (inches)	Drainage Class	Saturated Hydraulic Conductivity (Ksat)[1]	Hydrologic Soil Group[2]	Runoff Rate Class	Shrink-Swell Potential[3]	Wind Erodibility Group[4]	Off-Trail Erosion Hazard	Soil Suitability for Septic Systems
Alameda County Soil Types										
Altamont clay, moderately deep, 30–45% slopes, eroded	Clay	28-32	Well drained	Very low	D	Very high	High	4	-	Very limited
Linne clay loam, 30–45% slopes, eroded	Clay loam	36–40	Well drained	Very low	C	High	Moderate	4L	Severe	Very limited
Los Gatos–Los Osos Complex, 30-45% slopes, eroded	Loam	12–48	Well drained	Very low	C	High	Moderate	7	Severe	Very limited
Riverwash	Sand	>60	Somewhat poorly drained	Very high	A	Very low	NA	3	Very severe	NR
Rock land	Rock	10–20	Excessively drained	Very low	D	Very high	NA	8	Slight	NR
Vallecitos loam, 30-75% slopes, eroded	Loam	12–24	Well drained	Very low	D	High	Low to moderate	-	-	Very limited
Vallecitos rocky loam, 30-45% slopes, eroded	Gravelly loam	12–36	Well drained	Very low	D	High	Low to moderate	6	-	Very limited
San Joaquin County Soil Types										
Alo-Vaquero Complex, 30–50% slopes	Clay	>80	Well drained	Moderately low	D	Moderate	High	7	Severe	Very limited
Calla-Carbona Complex, 8–30% slopes	Clay loam	>80	Well drained	Moderately high	B	Moderate	Moderate	4L	Moderate	Very limited
Carbona clay loam, 2–8% slopes	Clay loam	>80	Well drained	Moderately low	D	Moderate	High	4	Slight	Very limited
Cogna loam, 0–2% slopes overwash	Loam	>80	Well drained	High	B	Moderate	Moderate	5	-	Very limited
Gonzaga-Honker-Franciscan Complex, 30–50% slopes	Loam	29	Well drained	Moderately high	D	Moderate	Moderate	6	Severe	Very limited
Honker-Vallecitos-Gonzaga Complex, 30–50% slopes	Loam	20	Well drained	Moderately high	D	Moderate	High	6	Severe	Very limited
Honker-Vallecitos-Honker Eroded Complex, 30–50% slopes	Gravelly loam	33	Well drained	Moderately high	D	Moderate	High	7	Severe	Very limited
Wisflat–Arburua–San Timoteo Complex, 30–50% slopes	Sandy loam	10	Well drained	High	D	Moderate	Low	3	Severe	Very limited
Wisflat–Arburua–San Timoteo Complex, 50–75% slopes	Sandy loam	10	Well drained	High	D	Moderate	Low	3	Very severe	Very limited
Xerofluvents-Xerorthents Complex, 1–8% slopes occasionally flooded	Gravelly sandy loam	>80	Well drained	High	A	NR	Low	5	Slight	Very limited

Notes: NA = not available; NR = not rated; SVRA = State Vehicular Recreation Area; > = greater than.

[1] "Ksat" is a measure of soil permeability; it refers to the ease with which water travels through the soil pores under saturated conditions.

[2] Hydrologic soil groups are based on runoff characteristics: Group A = low runoff potential, Group B = low to moderate runoff potential, Group C = moderate to high runoff potential, Group D = high runoff potential.

[3] Based on linear extensibility. Ratings of "moderate" to "very high" can result in damage to buildings, roads, and other structures.

[4] The soils assigned to Group 1 are the most susceptible to wind erosion, and those assigned to Group 8 are the least susceptible.

Sources: State Parks 2007a, based on U.S. Natural Resources Conservation Service soil survey data; NRCS 2022; data compiled by AECOM in 2023

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Under the California Surface Mining and Reclamation Act, the State Mining and Geology Board may designate certain mineral deposits as being regionally significant to satisfy future needs. Its decision whether to designate an area is based on a classification report prepared by the California Geological Survey (formerly California Division of Mines and Geology) and input from agencies and the public. In compliance with the Surface Mining and Reclamation Act, the California Geological Survey has established the classification system shown in Table 2-4 to denote both the location and the significance of key extractive resources.

Table 2-4. California Division of Mines and Geology Mineral Land Classification System

Classification	Description
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood for their presence exists
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated from existing data
MRZ-4	Areas where available data are inadequate for placement in any other mineral resource zone

Note: MRZ = Mineral Resource Zone
Source: Jensen and Silva 1988

The planning area is located adjacent to, but outside of, the mineral land classification boundaries contained in California Geological Survey studies prepared by Jensen and Silva (1988) and Stinson et al. (1987).

Paleontological Resources

Professional Paleontological Standards

The Society of Vertebrate Paleontology (SVP) (2010), a national scientific organization of professional vertebrate paleontologists, has established standard guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, specimen preparation, analysis, and curation. Most practicing professional paleontologists in the nation adhere to SVP's assessment, mitigation, and monitoring requirements, as specifically spelled out in the standard guidelines.

In its standard guidelines for assessment and mitigation of adverse impacts on paleontological resources, SVP (2010) established four categories of sensitivity for paleontological resources: high, low, none, and undetermined. Areas where fossils have been found previously are considered to have high sensitivity and high potential to produce fossils. Areas that are not sedimentary in origin and that have not been known to produce fossils in the past typically are considered to have low sensitivity. Areas consisting of high-grade metamorphic rocks (e.g., gneisses and schists) and plutonic igneous rocks (e.g., granites and diorites) are considered to have no sensitivity. Areas without any previous paleontological resource surveys or fossil finds are considered to be of undetermined sensitivity until surveys and mapping are performed to determine their sensitivity. After completion of reconnaissance surveys, observation of exposed cuts, and possibly subsurface testing, a qualified paleontologist can determine whether the area should be categorized as having high, low, or no sensitivity. In keeping with the significance criteria of SVP (2010), all vertebrate fossils are generally categorized as being of potentially significant scientific value.

Paleontological Resource Inventory Methods

A stratigraphic inventory and a record search were completed to develop a baseline paleontological resource inventory of the planning area and vicinity by rock unit and to assess the potential paleontological productivity of each rock unit.

Geologic maps and reports covering the geology of the planning area and vicinity were reviewed to determine the exposed rock units and to delineate their respective distributions in the planning area. The literature review was supplemented by an archival search conducted at the University of California Museum of Paleontology (UCMP) on June 28, 2023 (UCMP 2023).

Criteria for Paleontological Resource Assessment

The potential paleontological importance of the planning area can be assessed by identifying the paleontological importance of rock units that are exposed there. Because topographic maps can easily delineate the distribution of a rock unit, this method is conducive to determining the parts of the planning area that are of higher and lower sensitivity for paleontological resources.

A paleontologically important rock unit is one that is rated high for potential paleontological productivity and is known to have produced unique, scientifically important fossils. The paleontological sensitivity rating of a rock unit exposed in the planning area refers to the abundance and densities of fossil specimens, previously recorded fossil sites, or both in exposures of the unit in and near the planning area. Exposures of a specific rock unit in the planning area are most likely to yield fossil remains representing particular species in quantities or densities similar to those previously recorded from the unit in and near the planning area.

The following tasks were completed to establish the paleontological importance of each rock unit exposed in or near the planning area:

- The potential paleontological sensitivity of each rock unit was assessed, based on the density of fossil remains previously documented within the rock unit.
- The potential of a rock unit exposed in the planning area to contain a unique paleontological resource was considered.

Results of the Palaeontologic Resource Inventory

Stratigraphic Inventory

Regional and local surficial geologic mapping and correlation of the various geologic units near the planning area has been provided at a 1:250,000 scale by Wagner et al. (1991) and at a 1:24,000 scale by Dibblee (1980c, 1980d).

Paleontological Resource Inventory and Assessment by Rock Unit

Table 2-5 lists each formation present in the planning area and the formation's age and basic composition and summarizes the results of the records search performed at the UCMP on June 28, 2023. The table also presents the paleontological sensitivity of each rock unit, based on the assessment criteria listed above in the "Criteria for Paleontological Resource Assessment" section.

Table 2-5. Paleontological Inventory and Assessment

Formation Name	Age/ Composition	Summary of Records Search Results	Paleontological Sensitivity
Alluvium	Holocene stream and basin deposits	None. By definition, to contain unique fossil resources, a rock formation must be more than 11,700 years old. Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered "unique" paleontological resources.	No
Contra Costa Group (includes Orinda and Moraga)	Miocene nonmarine conglomerate, sandstone, shale, claystone, limestone, tuff	Twenty-nine vertebrate fossil localities have been reported from Alameda and Contra Costa Counties, and more than 50 fossil specimens were recovered during excavation of the Caldecott Tunnel. Fossils recovered included specimens of mammoth, rhinoceros, mastodon, camel, *Ticholeptus* (a hog-like plant eater), *Desmostylus* (a hippopotamus-like plant eater), *Barbourofelis* ("false" saber-toothed cat), *Cranioceras* (an even-toed ungulate), horse, rabbit, tortoise, rodents, and other unidentified mammals and reptiles. In addition, plant specimens were recovered in Alameda County and 14 invertebrate specimens were recovered (one in Alameda County, 13 in Contra Costa County) during excavation of the Caldecott Tunnel. (UCMP 2023)	High
San Pablo Group (includes Neroly, Cierbo, and Briones)	Miocene marine sandstone, mudstone, siltstone, shale, tuff	Localities V-4902 and V-5017, near the Alameda-Tesla property in Alameda County, yielded two unidentified vertebrate mammalian fossil remains. Three other localities in Alameda County, near Pleasanton and San Jose, also yielded vertebrate mammalian remains. Thirty-three vertebrate fossil localities have been reported from San Joaquin County, including V-3620 from Corral Hollow. This locality yielded 12 specimens of horse and camel. Localities V-4907 and V-4908 near the planning area yielded two horse specimens. Locality V-93127 near Castle Rock yielded three horse specimens and two elephant specimens. A total of 96 vertebrate fossil localities in the San Pablo Group from central and northern California counties have been reported to UCMP (2023).	High
Tesla (includes Laguna Seca)	Paleocene-Eocene marine sandstone, siltstone, mudstone, shale	No vertebrate fossil localities have been reported to UCMP (2023). However, locality P-22613 (also listed as P-3925) in the vicinity of the former Tesla Coal Mine yielded unidentified Paleocene plant remains. A total of 25 invertebrate fossil localities have been reported to UCMP (2023) in this formation from Alameda, San Joaquin, and Stanislaus Counties. Localities D-8147, D-8148, D-8151, D-8152, D-8153, D-8156, D-8158, and D-8159, all recovered in the vicinity of Tesla Road, yielded eight unidentified Eocene specimens of marine invertebrates. Throckmorton (1988:46) identified 18 genera of pelecypods and one scaphopod genus (marine mollusks), 13 genera of gastropods (slugs and snails), as well as coral, hearth urchin (a small sea urchin), an elasmobranch (the class of sharks, rays, and skates), and crab claws from the vicinity of the Alameda-Tesla property and along Tesla Road. Throckmorton also reported similar fossil remains in the Alameda-Tesla property area from other researchers, some of which encompass the UCMP localities listed above.	High
Moreno	Cretaceous marine shale and sandstone	More than 100 vertebrate fossil localities have been reported to UCMP (2023) from this formation, primarily in Fresno and Merced Counties, but stretching as far north as	High

Formation Name	Age/ Composition	Summary of Records Search Results	Paleontological Sensitivity
		Siskiyou County. A wide variety of vertebrate fossil specimens have been recovered including *Plotosaurus* (a large "swimming lizard"), *Morenosaurus* (a very large marine reptile named for the Moreno formation), bony fish, and unidentified fish and reptile remains. In addition, 95 invertebrate fossil localities have been recovered from this formation, including 12 from Alameda County and one from San Joaquin County.	
Panoche	Cretaceous marine shale, siltstone, sandstone	Only one vertebrate fossil locality has been reported from the Panoche formation, and that locality (which yielded an unidentified reptile specimen) is in Contra Costa County. More than 100 invertebrate fossil localities have been reported from several counties in central California. However, the only reported invertebrate localities in San Joaquin County consist of B-5818, B-7311, and B-7312, which yielded unidentified marine invertebrates. No localities have been reported in Alameda County (UCMP 2023).	Moderate
Franciscan Melange	Cretaceous-Jurassic fragmented rocks	There are only two reports of vertebrate fossils in the Franciscan Complex from California; however, one of them (a Jurassic-age marine reptile) was recovered from Corral Hollow locality V-3531. This fossil, consisting of a partial skull of *Ichthyosaurus franciscanus* (named for the Franciscan formation), is the type specimen for this species. Ichthyosaurs were generally about 6 feet long and may have weighed 200 pounds; in appearance, they were similar to dolphins. Seventeen invertebrate fossil localities have been reported in California, but none from Alameda or San Joaquin County (Bailey et al. 1964; UCMP 2023).	High because of type location for *Ichthyosaurus franciscanus*
Franciscan Chert	Cretaceous-Jurassic chert	Approximately 10% of the chert found within the Franciscan Complex is composed of the skeletons of tiny marine organisms called radiolarians (amoeboid protozoans). Where present, these fossilized organisms can be observed with a hand lens. (Bailey et al. 1964.) It is unknown whether the Alameda-Tesla property area contains any chert with radiolarian remains. However, radiolarians exist today in marine environments throughout the world; they are abundant and common and have been well studied.	Low

Sources: Bailey et al. 1964; Jefferson 1991a and 1991b; Stirton 1939; Throckmorton 1988; Wagner et al. 1991; UCMP 2023; data compiled by AECOM in 2023

2.3.1.3 Hydrology and Water Resources

Drainage Areas

The planning area is located primarily in the Corral Hollow watershed. Small headwater tributaries converge in the upper watershed to form the main stem of Corral Hollow Creek. The creek often infiltrates (flows into) the soil in the western reaches of the San Joaquin Valley and has no surface connection to the San Joaquin River. The watershed is flanked by the Arroyo Seco watershed to the west, Lone Tree watershed to the south, Deep Gulch Creek watershed to the east, and a small unnamed subwatershed of the San Joaquin River to the north. The Corral Hollow watershed spans the Alameda/San Joaquin County line and is bordered on the north by Tesla Road/Corral Hollow Road.

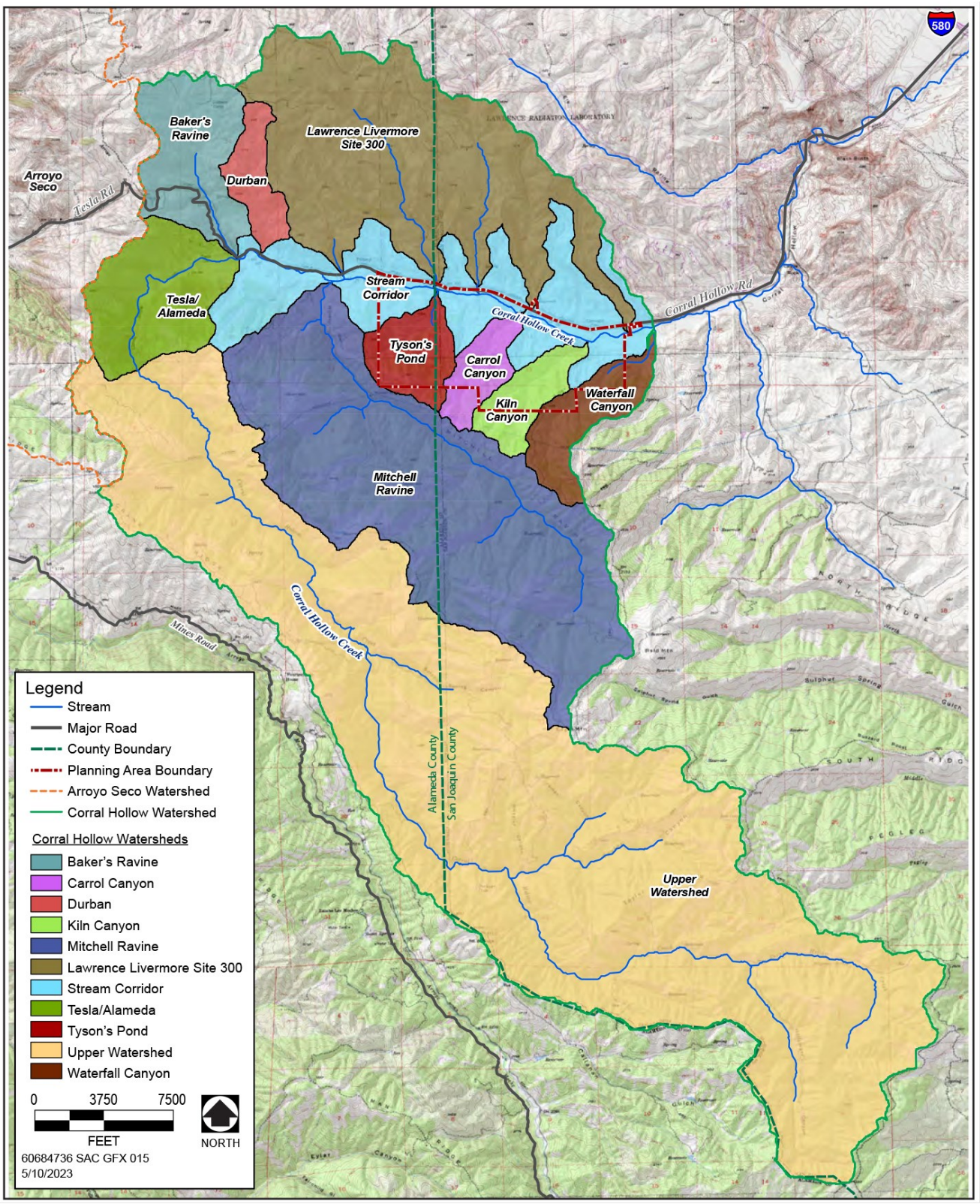
Vegetation in the Corral Hollow watershed consists of native and nonnative grasslands, oak woodlands, and chaparral. The watershed's outlet is located just downstream (east) of Carnegie SVRA's eastern boundary.

Salix and Geosyntec (State Parks 2007a:13–27) divided the Corral Hollow watershed into 11 smaller distinct drainage areas (Table 2-6, Figure 2-7) to increase the accuracy of the analysis. They used historical and current land uses, discharge locations, and proximity to critical areas to determine each drainage area's outlet point. The physical characteristics of the drainage areas are described below.

Table 2-6. Drainage Areas in the Corral Hollow Watershed

Drainage Area	Size (Acres)	Past and Current Land Uses
Baker's Ravine	963	Grazing, homesteading, mining/prospecting
Mitchell Ravine	4,845	Excavation and installation of Hetch Hetchy tunnel, sheep and cattle grazing, homesteading
Durban	349	Exploratory mining, grazing, residential uses
Lawrence Livermore Site 300	3,653	Exploratory mining, historical grazing, controlled burns, research and development associated with Lawrence Livermore National Laboratory
Stream Corridor	2,173	Divided into multiple subwatersheds: *Tesla Gate (99 acres):* Historical residential uses, grazing, ranching *Diablo Range District Office (413 acres):* Grazing, residential uses Mitchell Ravine Confluence *(20 acres)*: Grazing *Pottery (438 acres):* Horse and cattle grazing, pottery manufacturing, off-highway vehicle recreation *Maintenance Yard (10 acres):* Cattle grazing, exploratory mining, off-highway vehicle recreation *Western Day Use (198 acres):* Cattle grazing, exploratory mining (past); off-highway vehicle recreation, transportation (current) *Park Entrance (224 acres):* Cattle grazing, exploratory mining (past); off-highway vehicle recreation (current) *Los Osos Trailhead (3 acres):* Off-highway vehicle use, transportation (current) *Carnegie (445 acres):* Cattle grazing, exploratory mining (past); off-highway vehicle recreation (current) *SRI Road (194 acres):* Cattle grazing, exploratory mining (past); research and testing of explosives, off-highway vehicle recreation (current) *Riparian Reference Reach (130 acres):* Gravel extraction, cattle grazing, research and development
Tyson's Pond	460	Mining, sheep and cattle grazing (past), off-highway vehicle recreation (current)
Carrol Canyon	328	Sheep and cattle grazing (past), off-highway vehicle recreation (current)
Kiln Canyon	383	Sheep and cattle grazing, surface and tunnel mining for lime, cement processing activities associated with operation of lime kilns
Waterfall Canyon	526	Gravel surface mining, grazing, off-highway vehicle recreation (past), cattle grazing (ongoing)

Source: Data compiled by AECOM in 2013



Source: State Parks 2007a, adapted by AECOM in 2013 and 2016

Figure 2-7. Planning Area Watersheds

Watersheds within the Planning Area

Stream Corridor Drainage Area

The Stream Corridor drainage area in State Park ownership represents several smaller subwatersheds located along Corral Hollow Creek. The drainage area totals 2,173 acres between the Tesla Road gate and the eastern boundary of Carnegie SVRA. The following subwatersheds make up this drainage area:

- The *Tesla Gate* subwatershed (99 acres) is located between the Tesla Road gate and the discharge point of Baker's Ravine. Riverwash terraces flank the existing channel on both sides. The vegetation consists of primarily annual grasses with a few oaks. Historical residential uses, grazing, and ranching have occurred here. Tesla Road also runs through this subwatershed. A portion of this subwatershed area burned in August 2015 from the Tesla Fire and the SCU Complex fire in June 2022.
- The *Sector Office* subwatershed (413 acres) extends from the Tesla Gate subwatershed to the outlet of Mitchell Ravine. Lower terraces of riverwash and gently sloping upper terraces composed of loam soil flank the existing channel on both sides. The vegetation consists primarily of annual grasses, with oaks densely populating the northwest-facing slopes and sparse cottonwoods and mulefat within the channel. Grazing and residential uses have occurred here. Tesla Road also runs through this subwatershed. A portion of this subwatershed area burned in August 2015 from the Tesla Fire.
- The *Mitchell Ravine Confluence* subwatershed (20 acres) extends from the mouth of Mitchell Ravine to the Pottery subwatershed. This flat subwatershed is composed mainly of riverwash and silt loam formed from alluvium. The vegetation comprises some cottonwoods and sycamores, mulefat, scattered oaks, and annual grasses. Grazing has occurred here. Tesla Road also runs across a portion of this subwatershed. A portion of this subwatershed area burned in August 2015 from the Tesla Fire.
- The *Pottery* subwatershed (438 acres) encompasses the area between the Mitchell Ravine Confluence subwatershed and the outlet of the Tyson's Pond drainage area. Corral Hollow Creek evenly bisects this subwatershed, which extends upslope on both sides of the stream channel. The vegetation consists of some cottonwoods, mulefat, scattered oaks, and annual grasses. Horse and cattle grazing, pottery manufacturing, and OHV use have occurred here. Tesla Road also runs through this subwatershed.
- The *Maintenance Yard* subwatershed (10 acres) extends a short distance from the eastern area of the maintenance yard to the outlet of the Tyson's Pond drainage area. The maintenance shop for the Carnegie SVRA is located within this subwatershed. The low-gradient terrace above the stream is composed of riverwash. Vegetation in the upper portions of the subwatershed consists of annual grasses and a few oaks. The area adjacent to the stream channel is denuded of vegetation because of OHV activities. Although the area has not yet been revegetated, the OHV route has been delineated and a project funding request has been submitted to put in landscaping and day-use shade ramadas. Cattle grazing, exploratory mining, and OHV use have occurred in this subwatershed.
- The *Western Day Use* subwatershed (198 acres) extends from the outlet of the Tyson's Pond drainage area to the Carnegie SVRA entrance, to just upstream of the Middle Track trailhead. Corral Hollow Creek bisects this subwatershed. A low terrace of clay loam soil with 2–8 percent slopes occupies an area north of and adjacent to the stream channel. Vegetation in the upper portion of the subwatershed consists of annual grasses and forbs, with some cottonwoods and mulefat in the riparian corridor. Past land use activities consist of cattle grazing and exploratory mining. The southern portion of the area (outside the stream channel) is currently used for OHV recreation and transportation.
- The *Park Entrance* subwatershed (224 acres) is located between the Western Day Use subwatershed and the mouth of Carrol Canyon. Corral Hollow Creek bisects this subwatershed, and Corral Hollow Road runs through a portion of it. As in the other subwatersheds along the stream, a low terrace of clay loam occupies an area north of and adjacent to the stream channel. Vegetation in the upper portions of the subwatershed consists of annual grasses and forbs, with some cottonwoods

and mulefat in the riparian corridor. Past land use activities consist of cattle grazing and exploratory mining. The subwatershed's southern portion (outside the stream channel) is currently used for OHV recreation.

- The *Los Osos Trailhead* subwatershed (3 acres) encompasses the area at the mouth of Carrol Canyon. This subwatershed consists of a small portion of the stream channel and a clay loam terrace with slopes of 2–8 percent. Vegetation consists of annual grasses and forbs in the upper portion of the subwatershed. Most of the area (outside the stream channel) is used for OHV recreation and transportation.
- The *Carnegie* Subwatershed (445 acres) is located between the mouth of Carrol Canyon and the mouth of Kiln Canyon. The stream bisects this subwatershed, which extends upward on both sides of the stream channel. A low terrace of clay loam soil with 2–8 percent slopes is present north of and adjacent to the stream channel. Corral Hollow Road also runs through a portion of the subwatershed. Vegetation in the upper portion of the Carnegie subwatershed consists of annual grasses and forbs, with some cottonwoods and mulefat in the riparian corridor. This subwatershed was named for the Carnegie Brick Plant, the Carnegie Hotel and bunkhouses, and the town of Carnegie, which were all located in this area. A railroad spur was constructed to connect the brick plant to the Alameda and San Joaquin Railroad for transportation of goods. Past land use activities also included cattle grazing and exploratory mining. The southern portion of the subwatershed (outside the stream channel) is currently used for OHV recreation. A portion of this subwatershed area burned in July 2019 from the Hollow Fire.
- The *SRI Road* subwatershed (194 acres) extends from the mouth of Kiln Canyon to the eastern boundary of Carnegie SVRA. Corral Hollow Creek bisects this subwatershed, which extends upward on both sides of the stream channel. The subwatershed contains a broad area of floodplain with slopes of 2–8 percent where the stream valley widens substantially. Vegetation in the upper drainage consists of annual grasses and forbs, with some cottonwoods, sycamores, and mulefat in the riparian zone. Past land use activities included cattle grazing and exploratory mining. In addition, approximately 2 acres of the drainage area south of the planning area boundary are owned by SRI and are used for research and testing of explosives. Finally, the remaining portion of the subwatershed is owned by State Parks and is used for OHV recreation. A portion of this subwatershed area burned in July 2019 from the Hollow Fire.
- The *Riparian Reference Reach* subwatershed (130 acres) encompasses the area between the eastern park boundary and the mouth of Waterfall Canyon. Corral Hollow Creek bisects the subwatershed, which includes a broad area within the floodplain and several gravel mining waste rock piles. Vegetation in the subwatershed consists of annual grasses and forbs, with an area of dense cottonwoods, mulefat, willow, and a few sycamores in the riparian corridor. Past and current land uses consist of gravel extraction, cattle grazing, and research and development. A portion of this subwatershed area burned in July 2019 from the Hollow Fire.

Tyson's Pond Drainage Area

The Tyson's Pond drainage area occupies 460 acres from the northeastern boundary of the Mitchell Ravine drainage area to Carnegie SVRA's maintenance yard. Before entering the main stem, runoff flows through a series of sediment ponds—Franciscan Pond, Clear Pond, and finally Tyson's Pond. The drainage area consists of smooth, rounded hills with 30–50 percent slopes in its northern portion and rugged 30–70 percent slopes with some areas of exposed bedrock in its southern portion. The vegetation consists of annual grasses, coyote brush, oak, California buckeye, juniper, California sagebrush, and other coastal sage species.

Most of this area is used for OHV recreation. The northern portion is used as an open riding area, and the southern portion is a trails-only riding area. Past land use activities have included mining and extensive sheep and cattle grazing. Tyson's Pond sits atop the entrance to the historic Alameda Mine. The remnants of a hoist house and the French Company Mine can also be found in the drainage area.

Carrol Canyon Drainage Area

The Carrol Canyon drainage area extends 328 acres from the northeastern boundary of the Mitchell Ravine drainage area to Carnegie SVRA's entrance. Before entering the main stem, runoff flows through Lower Juniper Pond and Carrol Pond. The drainage area consists of smooth, rounded hills and rugged areas of exposed bedrock in its northern and southern portions, respectively. The canyon frequently contributes flows to Corral Hollow Creek during the rainy season. Vegetation consists of annual grasses, coyote brush, oak, California buckeye, juniper, California sagebrush, and other coastal sage species. Past land uses consist of extensive sheep and cattle grazing. Most of the area is now used for OHV recreation. The northern portion is used as an open-riding area and the southern portion is a trails-only riding area. Carrol Canyon is bisected by the East Hills/West Hills boundary.

Kiln Canyon Drainage Area

The Kiln Canyon drainage area occupies 383 acres from the northeastern boundary of the Mitchell Ravine drainage area to the intersection of SRI Road and Kiln Canyon Trail. Before entering the main stem, runoff is routed through Kiln Pond. The drainage area consists of smooth, rounded hills in its northern portion and rugged areas of exposed bedrock in its southern portion. The canyon frequently contributes flows to Corral Hollow Creek during the rainy season. Vegetation consists of annual grasses, coyote brush, oak, California buckeye, juniper, California sagebrush, and other coastal sage species. The northern portion of the Kiln Canyon drainage area is used as an open-riding area and the southern portion is a trails-only riding area.

Past land use activities consist of extensive sheep and cattle grazing, surface and tunnel mining for lime, and cement processing activities associated with lime kilns that were operated in the drainage area. The Hollow Fire, which broke out in July 2019 denuded a portion of the drainage area vegetation.

Waterfall Canyon Drainage Area

The Waterfall Canyon drainage area consists of 526 acres extending from the northeastern boundary of the Mitchell Ravine drainage area to the intersection of Corral Hollow Creek and the planning area's eastern boundary. The northern portion of the drainage area consists of smooth, rounded hills and the southern portion includes rugged areas of exposed bedrock. The vegetation consists of annual grasses, coyote brush, oak, juniper, California sagebrush, and other coastal sage species. Past land use activities consist of gravel surface mining, grazing, and OHV use. OHV use is currently prohibited in the drainage area. The Hollow Fire, which broke out in July 2019 denuded a portion of the drainage area vegetation.

Watersheds Outside of the Planning Area

Baker's Ravine Drainage Area

The Baker's Ravine drainage area is a 963-acre canyon that extends from the northern edge of the Corral Hollow watershed to the confluence of the ravine's drainage and Corral Hollow Creek's main stem. The vegetation consists of annual grasses, scattered oaks, and some California sagebrush.

Approximately 6.5 acres of the drainage area consist of steep impervious terrain associated with Tesla Road/Corral Hollow Road. Much of the terrain flanking the roadway consists of steep cut slopes. These cut slopes erode during heavier rainfall events, contributing a large amount of sediment into the roadway ditches. The sediment-laden water is naturally channelized and eventually conveyed to Corral Hollow Creek.

The steepness of slopes, heavy grazing of vegetation, and compacted nature of this drainage area's soils can result in high rates of runoff flow, which is collected in the valley of the canyon and routed to Corral Hollow Creek through the roadway ditches. Flows in the drainage ditches may persist for a few weeks after a high-rainfall event.

Past and current land use activities consist of grazing, homesteading, and some mining/prospecting. A major fire that broke out in 2005 denuded the drainage area of vegetation. A portion of the drainage area burned south of Corral Hollow Road in August 2015 from the Tesla Fire as well.

Mitchell Ravine Drainage Area

The Mitchell Ravine drainage area is a 4,845-acre canyon that extends from the southeastern boundary of the Corral Hollow watershed to the confluence of the ravine's drainage course and Corral Hollow Creek's main stem. The ravine is oriented parallel to and shares a boundary with the Upper Watershed drainage area. Mitchell Ravine is the largest tributary of Corral Hollow Creek in the watershed's study area. The slopes of Mitchell Ravine are rugged, and bedrock is exposed in some areas. Streamflows in the ravine are infrequent, occurring only during large events that are preceded by a long period of wet weather. The vegetation consists of annual grasses, coyote brush (*Baccharis pilularis*), oak, California sagebrush, and other coastal sage species.

Past and current land use activities consist of excavation and installation of the Hetch Hetchy tunnel, extensive sheep and cattle grazing, and homesteading. Mitchell Ravine contains blue sediment that comes from erosion of the waste rock piles left from the construction of the Hetch Hetchy tunnel which is transported downstream during large storm events. The Tesla Fire, which broke out in August 2015, and the SCU Complex fire that broke out in September 2020, denuded a portion of the drainage area of vegetation.

Durban Drainage Area

The Durban drainage area totals 349 acres in private ownership between the northern boundary of the watershed and Corral Hollow Creek's main stem. Flows from the drainage area are routed under Tesla Road through a culvert. The area consists of steep rolling hills with some rugged rock outcrops. The vegetation comprises annual grasses, scattered oaks, and some California sagebrush. Streamflows in this drainage area may persist for a few days after a high-rainfall event. Past and current land use activities consist of limited exploratory mining, grazing, and residential uses. A major fire that broke out in 2005 denuded the drainage area of vegetation.

Lawrence Livermore Site 300 Drainage Area

The Lawrence Livermore Site 300 drainage area totals 3,653 acres and comprises several smaller subwatersheds that drain from the north into Corral Hollow Creek. The vegetation consists of annual grasses, scattered oaks, and sage. Streamflows in this drainage area may persist for a few weeks after a high-rainfall event. Past and current land use activities consist of limited exploratory mining, historical grazing, controlled burns, and research and development associated with LLNL.

Hydrology

Climate and Precipitation

The climate of the Corral Hollow watershed consists of mild to hot, dry summers and mild, wet winters. Temperatures are generally coolest in January and warmest in July. Humidity is highest during the winter months and becomes quite low during the hot summer months. Because of the summer's low humidity, the evaporation rate is high during the growing season. Therefore, soil moisture reserves are depleted rapidly during the summer months. Humidity is also highest in the morning and lowest in the afternoon. The dominant geomorphic processes that have shaped the watershed's hills and low mountains include mass wasting from landslides and fluvial erosion.

The upper elevations in the region receive more rainfall than lower elevations. Intense rainfall is rare because the Coast Ranges moderate the spring storm systems coming onshore from the Pacific Ocean. As storm systems descend the northeastern-facing slopes, the air temperature increases and the air dries out, thus creating a "rain shadow." A rain shadow is a region that receives less rainfall and humidity than the surrounding areas because of topography and prevailing wind patterns.

Rainfall in the Corral Hollow watershed generally occurs as lengthy events of low intensity. The rainfall/runoff relationship in the Corral Hollow watershed is controlled primarily by low-intensity rainfall, the steepness of the canyon slopes, and the varied infiltration by the surficial soils. On average, approximately 57 percent of annual rainfall occurs in the winter months (December through January) and

80 percent occurs between November and March. Very little rain falls between June and September. (State Parks 2007a:90–94.)

Hydrologic Modeling

Salix and Geosyntec simulated the hydrologic characteristics of the planning area using the U.S. Environmental Protection Agency's (EPA's) Storm Water Management Model. The model was used to conduct two types of simulations:

- *Continuous-rainfall modeling* simulates the continuous interactions between rainfall, runoff, infiltration, and evapotranspiration (ET). The model can be used for several purposes: to approximate the watershed's current water balance, to provide details about flow duration that are useful in assessing sediment transport, and to define how rainfall and runoff interact temporally and spatially. The model also can be used during watershed planning to assess how proposed land use modifications may affect watershed hydrology and sediment transport.
- *Discrete-event modeling* simulates peak-flow rates for a particular design storm event. This information is important when determining the size of sediment-removal BMPs and assessing how realignment of and modifications to streams affect an existing floodplain. The model was used to represent the peak-flow rate produced by 24-hour events occurring at various frequencies: 100 years, 10 years, and 2 years.

Salix and Geosyntec subdivided the Corral Hollow watershed into 74 subwatersheds, based on spatially consolidated properties (Figure 2-7). Subwatersheds were delineated based on topography and the Corral Hollow Creek stream network. For the modeling efforts, each subwatershed was assumed to be hydrologically independent, with no surface runoff flowing from one subwatershed into another (State Parks 2007a).

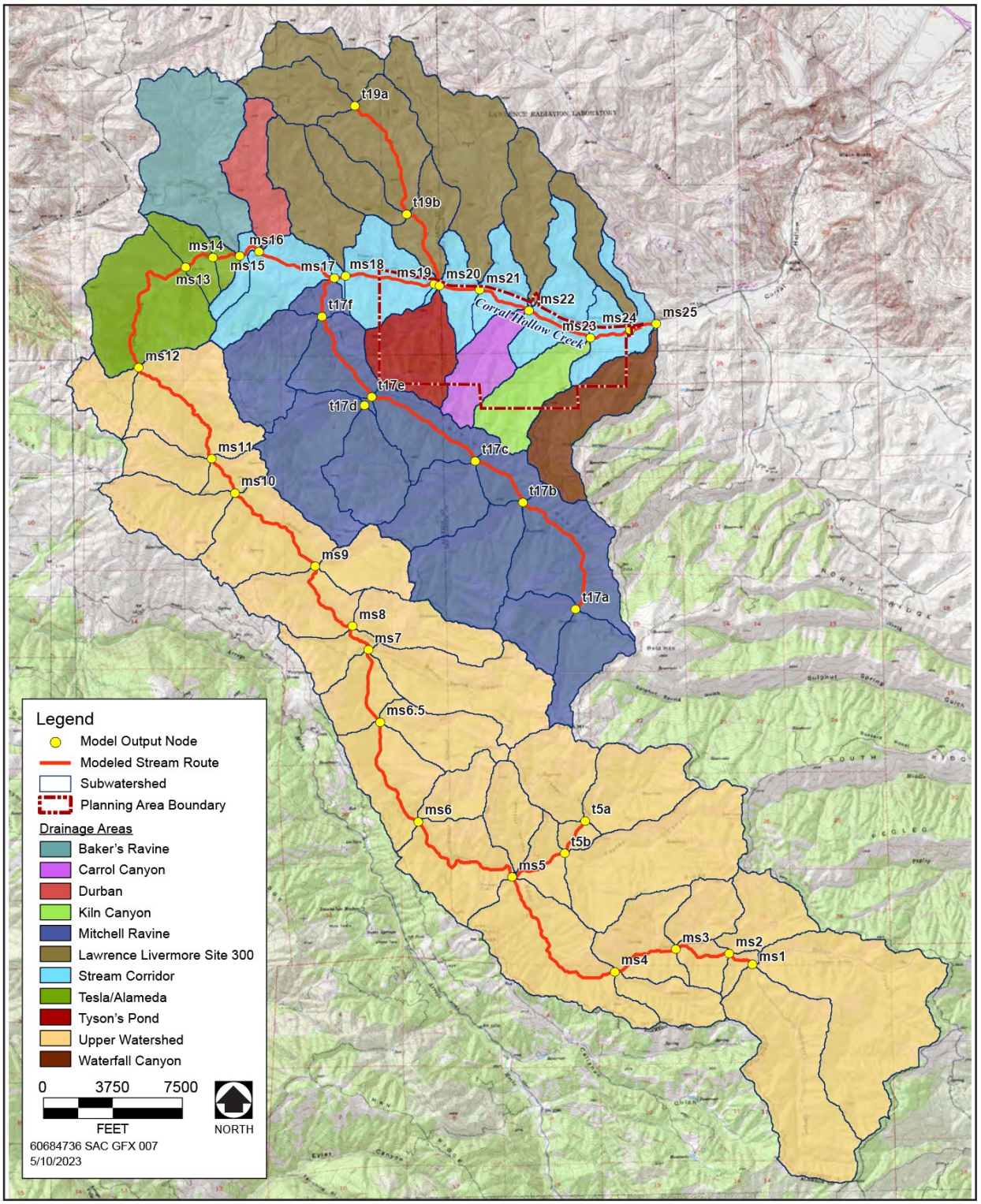
Continuous-Rainfall Modeling

The output from the continuous-rainfall simulation consisted of infiltration, ET, and surface-flow rates at every node of the model (Figure 2-7) for each time step simulated. The resulting data are presented as a water balance and as a flow-frequency distribution. A single rainfall event (during a year of exceptionally high rainfall) was analyzed separately. A summary of the results of hydrologic modeling from the 10-year continuous simulation is presented below.

Water Balance Analysis

A water balance is a direct accounting of the hydrologic processes occurring throughout the watershed. In this case, the water balance is summarized as the average monthly distribution of infiltration, surface ET, and surface runoff occurring at each of three locations in Corral Hollow Creek—output nodes ms13, ms19, and ms25 (Figure 2-8).

- **Output node ms13** is located just upstream of the Tesla Coal Mine Site. This output node provides modeled hydrologic information for areas of the Corral Hollow watershed that are not influenced by the former Tesla Coal Mine and OHV activities. Approximately 13,953 acres of the watershed contribute flows to this node. Most rainfall (determined as the sum of infiltration, surface ET, and surface runoff) occurs in February. In this portion of the watershed, a substantial amount of this rainfall can infiltrate into the soil because the infiltration rates of the soils upstream of node ms13 generally exceed the precipitation rates.



Source: State Parks 2007a; adapted by AECOM in 2014

Figure 2-8. Subwatersheds and Model Output Nodes

On average, most surface runoff occurs in December, February, and May, but rainfall volumes are considerably lower in May than in December and February. May runoff is disproportionately high because higher intensity precipitation events occur during that month and the preceding wet-weather conditions saturate the underlying soils. Because the most precipitation occurs in February, more water is ponded in depressional storage areas (e.g., puddles) than can be removed through evaporation.

The hydrologic modeling of the watershed upstream of ms13 predicted the following average annual water balance for this upstream area: approximately 95 percent of the runoff infiltrates into the soil, 4 percent is lost through ET, and only 1 percent is converted to surface runoff. The high infiltration volume and low runoff volume result primarily from the lack of impervious surfaces and the predominance of loamy soils in the canyon's upper elevations.

- **Output node ms19** is located in Corral Hollow Creek at the maintenance shed bridge. This output node receives flows from approximately 21,795 acres of the watershed, including all areas upstream of node ms13. The monthly distribution of infiltration, surface ET, and surface runoff volumes is similar to that of node ms13. The precipitation volume is larger at ms19 because of the additional tributary area between ms13 and ms19 (including Mitchell Canyon).

  As for output node ms13, the modeling results for output node ms19 showed that approximately 95 percent of the precipitation infiltrates into the soil, 4 percent is lost through ET, and 1 percent is converted to surface runoff. Although some sparse development exists in the planning area between nodes ms13 and ms19, the additional impervious area from roofs and driveways is small relative to the total contributing area of the watershed. Furthermore, the soils still are predominantly loam. Therefore, nodes ms13 and ms19 have similar average annual distributions of infiltration, ET, and runoff.
- **Output node ms25** is located at the eastern boundary of the planning area. In total, 27,923 acres of the Corral Hollow watershed, including areas upstream of nodes ms19 and ms13, contribute flows to the node. The monthly distributions of infiltration, ET, and surface runoff at nodes ms13, ms19, and ms25 are generally similar. However, volumes of surface runoff (the percentage of rainfall that is converted to runoff) increased disproportionately in January, March, and April at node ms25. This suggests that the clay soils in the portion of the Corral Hollow watershed between nodes ms19 and ms25 exhibit a lower infiltration capacity and thus contribute to higher runoff volumes. Similarly, for the average annual water balance at node ms25, surface runoff volumes increased while infiltration decreased.

Flow Duration Analysis

The model's most frequently predicted flow rates ranged from 1 to 60 cubic feet per second (cfs). At node ms25, the model predicted approximately 3,000 hours (125 days) of flows ranging from 1 to 4 cfs and 800 hours (33 days) of flows ranging from 5 to 9 cfs. Flow frequency decreased substantially at rates above 60 cfs, while flow rates seldom exceeded 550 cfs over the 10-year modeling period. The higher flow rates that did occur represented peak flows of larger storm events (such as the 2-year, 5-year, and 10-year events).

Single-Event Analysis

The results of the single-rain-event analysis from April 4, 2006 (which nearly overflowed the bridge over Corral Hollow Creek at node ms19) indicate that as expected, after the rainfall intensity exceeds the soil infiltration rate, rainfall is rapidly converted to surface runoff and transported to Corral Hollow Creek.

Discrete-Event Modeling

Four locations were selected for modeling of the existing and projected flow rates in Corral Hollow Creek for the 2-year, 10-year, and 100-year storm events. Nodes ms13 and ms14 provided flow information for the western end of Corral Hollow Creek (west of the planning area), while nodes ms23 and ms24 provided flow data for the eastern end of the creek (within and east of Carnegie SVRA). Table 2-7 shows the modeled existing peak-flow rates for each of the recurrence-interval storm events.

Table 2-7. Estimated Peak-Flow Rates for 24-Hour Storm Events and Stream Channel Locations

Recurrence Interval	Node ms13	Node ms14	Node ms23	Node ms24
2 years	8.9 cfs	13.7 cfs	257.9 cfs	257.9 cfs
10 years	136.2 cfs	136.0 cfs	635.0 cfs	635.1 cfs
100 years	735.8 cfs	739.4 cfs	1,444.1 cfs	1,444.8 cfs

cfs = cubic feet per second
Source: State Parks 2007a:110

The time to reach peak streamflow for each storm event ranged from 9.3 hours (for the 2-year and 10-year events) to 10 hours (for the 100-year event).

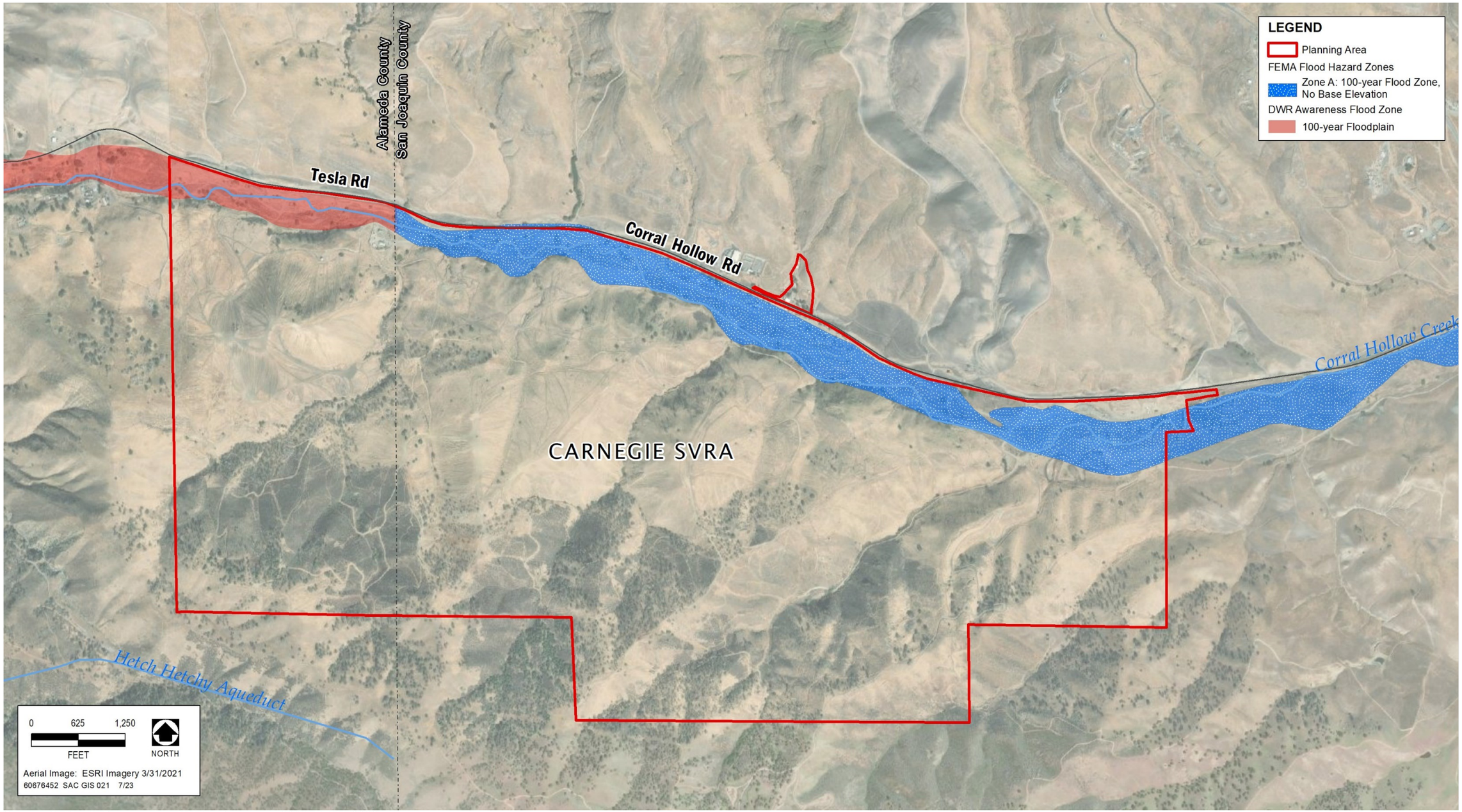
Hydraulics

Floodplain designations are important hydraulic engineering considerations when constructing buildings, roads, and bridges. The Federal Emergency Management Agency (FEMA) has mapped a portion of the Carnegie SVRA on Flood Insurance Rate Maps. A portion of the SVRA along Corral Hollow Creek in San Joaquin County is located within a FEMA 100-year floodplain (Zone A). In Alameda County, the portion of the SVRA that is along Corral Hollow Creek is classified by the California Department of Water Resources (DWR) as a 100-year Awareness Floodplain. The remaining portion of the planning area is above the 500-year floodplain level (Zone X) (Figure 2-9).

Erosion and Sediment Transport

The primary pollutant in the Corral Hollow watershed—sediment—is ultimately delivered to Corral Hollow Creek. Several sources in and near the SVRA can generate erosion that causes sediment transport. These sources—sheet erosion, gullies, grazing, waste rock piles, trail and stream crossings, and roads and trails—are summarized below.

- *Sheet Erosion.* Sheet erosion occurs when soil particles are detached by falling raindrops and moved downslope by water that flows overland as a sheet, instead of in defined channels or rills. A generally uniform layer of fine particles is removed from the entire surface of an area, which can result in extensive loss of topsoil. Sheet erosion occurs in two stages. During the first stage, rain splash, raindrops knock soil particles into the air. During the second stage, the loose particles are moved downslope, commonly by sheet flooding. Broad sheets of rapidly flowing water filled with sediment represent a potentially high erosive force. Generally produced by cloudbursts, sheet floods are brief and commonly move only short distances. On relatively rough surfaces, sheet flooding may give way to rill wash, in which the water moves in a system of enmeshed microchannels, which eventually become larger and develop into gullies.
- *Gullies.* Gullies can form naturally but often are made worse by human activities. Gullies have formed in the planning area largely because improperly designed trails and stream crossings have modified watershed hydrology. Channelization, concentration, and diversion of runoff can compound erosive forces and create substantial scouring at the discharge point of the concentrated flow path. This can cause gullies to form.
- *Grazing.* The Corral Hollow watershed has been grazed by sheep, wild horses, and cattle for more than 150 years. The rangelands have become degraded because reduced organic matter and ongoing animal grazing have caused continuous soil compaction, and because vegetation cover has declined. The rangelands were invaded by short-lived, nonnative weeds that have shallow root structures and thus offer reduced soil protection.
- *Waste Rock Piles.* During the Tesla mining era, spoils from mining activities were deposited near the northern banks of Corral Hollow Creek approximately 1.5 miles upstream from the SVRA. The waste rock now parallels the creek for approximately 1,200 feet. The creek has slowly migrated toward these waste rock piles over the years, and today it is actively eroding the toes, which is resulting in sediment transport to Corral Hollow Creek upstream of the SVRA.



Source: California Department of Water Resources 2008, FEMA 2020

Figure 2-9. Floodplain Map

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- *Trail and Stream Crossings.* A stream crossing is a point on a trail or roadway that intersects a natural drainage path. The high velocity of runoff flowing through a crossing can cause substantial erosion. Improperly designed crossings can damage trails and divert runoff to sensitive areas of the watershed that can erode easily.
- *Roads and Trails.* If designed improperly, roads and trails can alter a watershed's natural drainage patterns. As a result, they can contribute substantially to erosion and mobilization of sediment. Roads and trails can inadvertently become conveyance features by collecting runoff from upland slopes and diverting it from its natural drainage course. When runoff is concentrated on a trail's inboard side, substantial erosion can occur, especially where the trail is not surfaced. Runoff flows can cause additional erosion at the point where the concentrated flow is released. In addition, the increased energy from concentrated flow can cause soil piping where the flow path contacts a weak area of the trail or an existing animal burrow.

Existing Erosion/Sediment Controls

The Carnegie SVRA has several features that either exist in the landscape or are implemented as needed to control erosion and sediment transport. These features—sediment basins, revegetation/erosion-control blankets, dust suppressants, and gully rehabilitation—are subject to modification in future versions of the SWMP or similar documents, but current practices and features are described briefly below.

Sediment Basins

Several sediment basins or stock ponds located throughout Carnegie SVRA have been used to reduce loading of sediment into Corral Hollow Creek:

- *Tyson's Pond* is located at the outlet of the Tyson's Pond drainage area (adjacent to Carnegie SVRA's maintenance shop), approximately 400 feet south of Corral Hollow Creek. The pond was constructed adjacent to and partially within a historic mine shaft and waste rock piles. These mine features are located along the southwest edge of the pond. The pond's outlet structure consists of a perforated corrugated metal pipe located near the northern bank. The pipe discharges at the base of a gabion wall that serves as the basin's northern wall and spillway. Sediment is removed annually from this pond.
- *Carrol Canyon Pond* is located at the outlet of the Carrol Canyon drainage area, approximately 200 feet south of Corral Hollow Creek and 1,000 feet southeast of Carnegie SVRA's kiosk and park entrance. The outlet structure consists of a corrugated metal pipe riser located near the northern bank of the pond. The riser routes flows to a drainage channel that discharges to Corral Hollow Creek. Sediment is removed annually from this pond.
- *Kiln Canyon Pond* is located within the Kiln Canyon drainage area, approximately 1,500 feet south of Corral Hollow Creek. The pond receives flows from approximately 345 acres (90 percent) of the 383-acre drainage area. The pond's outlet structure consists of a slotted 24-inch corrugated metal pipe riser with a grated overflow. A compacted earthen berm serves as the pond's spillway. Flows from the pond enter the natural drainage path of Kiln Canyon and eventually discharge to Corral Hollow Creek. Sediment is removed annually from this pond.
- *Lower Juniper Pond* is located approximately 4,090 feet upstream of Carrol Canyon Pond, within the headwaters of the Carrol Canyon drainage area. The pond intersects the Happiness Valley and Lower Juniper Trails and is primarily devoid of vegetation. Originally constructed as a livestock pond, Lower Juniper Pond now collects runoff from several ephemeral tributaries within the upper 110 acres of the Carrol Canyon drainage area. The pond does not have a corrugated metal pipe riser, outlet structure, or stabilized spillway. Because the basin lacks an outlet structure, retained flows are removed through infiltration and evaporation.
- *Franciscan Pond* is located in the upper reaches of the Tyson's Pond drainage area, approximately 3,750 feet upstream of Tyson's Pond. Franciscan Pond experiences a substantially smaller influx of sediment than the other SVRA ponds, as indicated by the dense vegetative growth in this pond. The pond's western abutment was likely formed by a landslide. The outlet structure of the pond consists of

a perforated corrugated metal pipe riser. The spillway consists of an unstabilized depression that crosses the Franciscan Loop Trail and discharges into a deeply incised channel.

Revegetation

Revegetation and erosion control are implemented in accordance with the *OHV BMP Manual for Erosion and Sediment Control* (OHV BMP Manual) (State Parks 2007b). Currently, however, bare slopes are seeded with a native grass/legume erosion-control seed mix and covered with a hydromulch or straw. Fiber rolls (straw wattles generally manufactured from rice straw enclosed in burlap) are installed across slopes to reduce overall slope length. The rolls are spaced 20–50 feet apart, depending on hill slope and contour, and are anchored with wooden stakes every 4 feet.

Dust Suppressants

During the dry season, wind can lead to dust-control issues. To help minimize airborne dust, State Parks applies a dust suppressant to the main park road, campgrounds, and staging areas. The suppressant consists of magnesium chloride, a noncorrosive compound often used as a deicer. The dust suppressant is applied every spring, using water application trucks. Water is also used for dust control as needed.

Gully Rehabilitation

Gully rehabilitation is implemented in accordance with the OHV BMP Manual (State Parks 2007b). The practices described here may be modified in the future. Currently, however, State Parks staff members identify the cause or source of gully erosion, and then divert water to allow rehabilitation activities to eliminate gully formation. State Parks uses rock check dams to slow the velocity of flows and dissipate erosive forces. Rock check dams also promote sedimentation and can reverse incising. Check dams can be constructed of materials such as rocks, logs, and sandbags. They are typically installed intermittently throughout the length of the gully. Rock check dams also can be installed in drainage ways to prevent gullies from forming. Emergency and immediate short-term fixes include using hay bales packed in the gully as a filter medium to slow down water flow and promote sediment deposition to reverse incising. The hay also provides protection and nutrients to help reestablish native vegetation.

Stream Geomorphology

Small headwater tributaries converge in the upper portions of the Corral Hollow watershed to form the main stem of Corral Hollow Creek. Additional tributaries contribute to the stream as it flows toward the outlet of the watershed.

Corral Hollow Creek has three distinct zones:

- The *upper watershed* is characterized by cascading pool riffle sequences with large boulders, rugged canyons, a steep longitudinal profile, and higher rainfall.
- The *transitional zone* of the stream begins upstream of the Tesla Coal Mine Site and extends to the mouth of Mitchell Ravine. This section of the creek has a 2 percent longitudinal gradient with slight meandering bends, slow-moving pools, and swift riffles.
- The *depositional zone* of the stream begins below the mouth of Mitchell Ravine, where the valley opens, the gradient drops to 1 percent, and aggradation is the predominant sediment process. In this portion of the watershed, the stream is dominated by multiple-treaded/braided channels.

A geophysical investigation was conducted in October 2004 to identify the historical thalweg (deepest point) of the stream channel. Within Carnegie SVRA, the historical thalweg was generally against the southern margin of the valley floor. This was most likely a braided stream environment with heavy bed load, similar to the present-day stream environment. The dominant stream channel would have naturally ranged across the valley floor in response to deposition and scour cycles. Historically, the stream channel has been aggrading (rising or building up) because of uplifts and changes in the landscape. Because of these deposits, Corral Hollow Creek has not carved a substantial path in the underlying Franciscan Formation. The refractive seismology indicated that alluvium sediments extend to depths of 8–10 feet below the channel bed. The substrate comprises old alluvium, cobbles, and boulders to a depth of 18–25 feet. The bedrock layer was found below the old alluvium layer.

Stream geomorphology has been adversely affected by grazing, mining, and past OHV riding in and adjacent to Corral Hollow Creek, which have destabilized the streambank (State Parks 2007a:139–140).

Water Quality

Historical Effects on Water Quality and Responses by State Parks

Coal, clay, gravel, lime, manganese, and sand were mined from Corral Hollow intermittently from 1856 to 1960. The extensive mining activities led to the formation of waste rock piles adjacent to Corral Hollow Creek approximately 1.5 miles upstream of the SVRA. As mentioned in the waste rock discussion in "Erosion and Sediment Transport," the creek is eroding the piles and transporting the material downstream. Historical grazing activities also have caused water quality to decrease. In addition, water quality is also affected by metals from the former Tesla Coal Mine and LLNL Site 300, which are not within the boundaries of the Carnegie SVRA.

In Carnegie SVRA, increased sediment load and runoff from destabilized parking areas, roads, and trails contributed to the degradation of water quality in Corral Hollow Creek. Volunteer trails (created by OHV use off maintained trails), and improperly constructed/maintained roads and trails, previously altered drainage and caused gullies to form.

State Parks has since implemented BMPs throughout Carnegie SVRA to reduce runoff and control erosion, using a variety of methods contained in the BMP manual and the SWMP. Also, since receiving the water quality data reported below from Salix and Geosyntec (State Parks 2007a), State Parks has implemented a stream revegetation program along Corral Hollow Creek within Carnegie SVRA, and OHV use is no longer permitted in that area.

Results of Corral Hollow Creek Monitoring

To assess the existing water quality of Corral Hollow Creek, Salix and Geosyntec jointly began a 2-year water quality monitoring program. Water samples were collected from 12 locations in the creek and its tributaries during three rainfall events that occurred during the 2005 and 2006 wet seasons. Water quality data previously collected by EPA, the Central Valley Regional Water Quality Control Board (RWQCB), State Parks, Resource Design Technology, and LLNL were also reviewed and considered. Water quality data was also collected in 2014 (State Parks 2015a).

Comparison to Basin Plan and California Toxics Rule Criteria

The water quality data were compared to applicable criteria in the *Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region* (Basin Plan) (Central Valley RWQCB 2019) and the California Toxics Rule (CTR). The results of the analysis are summarized below.

Metal concentrations for all samples were below applicable CTR criteria for acute or chronic toxicity, with the exception of one sample collected on April 4, 2005. Total copper concentrations at Station 6, located near the discharge point of Tyson's Pond, were measured at 19 micrograms per liter, which slightly exceeded the acute CTR criterion of 15 micrograms per liter. The CTR criteria were based on the single lowest value observed in the main stem of Corral Hollow Creek; however, the hardness values measured at Station 6 were much higher and effectively reduced the toxicity of copper at the point of sampling. Total and dissolved concentrations of silver and cadmium and dissolved concentrations of lead were not detected in any of the samples (State Parks 2007a:166).

The Basin Plan (Central Valley RWQCB 2019) does not specify beneficial uses or water quality objectives for Corral Hollow Creek. According to the tributary rule, the beneficial uses assigned to any downstream water body would also apply to the creek.

The Basin Plan does specify general water quality objectives for all water bodies in the Sacramento and San Joaquin River Basins. With the exception of pH, the objectives are narrative. The measured pH of samples collected from the April 4, 2005, event fell within the range of applicable pH conditions specified in the Basin Plan. A few samples collected during the events of January 3, 2006, and March 20, 2006, were below the Basin Plan pH threshold of 6.5 (State Parks 2007a:166).

Assessment of Hot Spots, Effects of the Tesla Coal Mine, and Trends in Constituent Concentrations

Water quality data were also assessed for three reasons:

- to determine whether any sampling stations were serving as "hot spots" exhibiting substantially higher concentrations of constituents,
- to determine whether the Tesla Coal Mine was adversely affecting Corral Hollow Creek's water quality, and
- to investigate trends in constituent concentrations as a function of their location within the creek's main stem.

A summary discussion of the results is presented below.

Hot Spots

Of the six total locations sampled in Carnegie SVRA, Stations 3, 4, and 6 consistently exhibited higher pollutant concentrations than the other stations sampled. Figure 2-10 presents the locations of water quality sampling stations.

Station 3, located at the confluence of Corral Hollow Creek and Baker's Ravine, receives flows from the northern tributary adjacent to Tesla Road. This tributary area is primarily grazed open space and is approximately 1.25 miles west of the SVRA, but it contributes flows to Corral Hollow Creek.

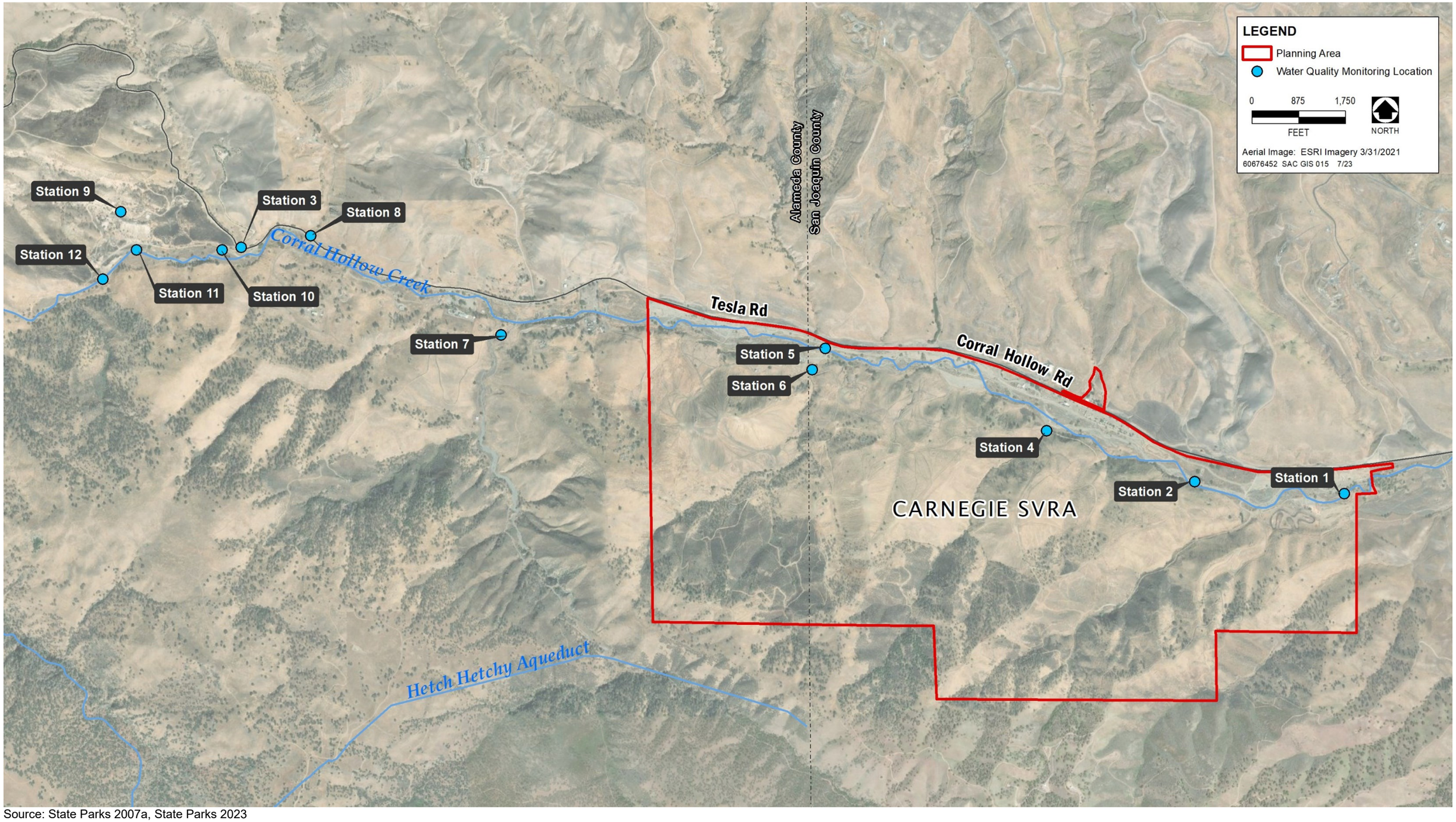
Carrol Pond receives flows from a relatively large portion of Carnegie SVRA. The pond drains through a perforated riser pipe and discharges to Station 4 on Corral Hollow Creek downstream of the Carnegie SVRA ranger station. Flows from Carrol Pond deposited substantial amounts of sediment and debris around Station 4 during sampling events.

Station 6 (discussed above under "Comparison to Basin Plan and California Toxics Rule Criteria") has a 460-acre tributary area that drains Carnegie SVRA's trails and roads. It should be noted that before the 2006 wet season, park personnel removed accumulated sediment from Tyson's Pond. Removing this sediment greatly increased the pond's capacity, so not enough flows were leaving the pond to allow sampling during the March 20, 2006, rainfall event (State Parks 2007a:164.).

Tesla Coal Mine Effects

The analysis of data collected by Salix and Geosyntec for the rainfall events of January 3, 2006, and March 20, 2006, indicated that the Tesla Coal Mine and the associated canyons may be contributing excessive concentrations of total suspended solids (TSS) to Corral Hollow Creek. The Tesla Coal Mine also appeared to contribute sulfates and manganese to Corral Hollow Creek, although these constituents were analyzed for only the March 20, 2006, event. Sources of manganese could include the deposits in the Franciscan cherts located in the upper portions of Corral Hollow Creek. Dissolved concentrations of chromium, lead, silver, cadmium, and selenium and total concentrations of silver, cadmium, and selenium were below detection limits.

Sampling from data collected upstream and downstream of the Tesla Coal Mine by State Parks and Resource Design Technology showed higher concentrations of total hardness and total and dissolved silver downstream of the mine. Elevated amounts of TSS and total dissolved solids (TDS) were also observed downstream of the mine, but this may have occurred in part because of streamflow contributions into the main stem from Baker's Ravine. Total and dissolved concentrations of arsenic, cadmium, chromium, lead, and selenium either were not detected or remained close to the detection limits in each of the two studies and are therefore substantially lower than hazardous waste criteria (State Parks 2007a:165–167).



Source: State Parks 2007a, State Parks 2023

Figure 2-10. Water Quality Sampling Locations

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Water Quality Constituents by Location Upstream of Carnegie SVRA

Geosyntec and LLNL sampled water quality at two locations in Corral Hollow Creek immediately upstream of the active portions of Carnegie SVRA. The goal was to obtain an indication of the creek's water quality before accounting for the potential effect of OHV recreational use. The LLNL sample exhibited substantially lower TSS concentrations than the samples collected at the west end of Carnegie SVRA, while pH and total iron concentrations were similar in the SVRA and upstream. Concentrations of total arsenic, cadmium, lead, selenium, and silver were either below or near the detection limits, both within Carnegie SVRA and upstream (State Parks 2007a:168.).

Overall Findings

To summarize the relevant overall findings related to water quality (State Parks 2007a:168–169):

- Total and dissolved concentrations of silver and cadmium and dissolved concentrations of lead were not detected in any samples collected by Geosyntec.
- Neither acute nor chronic CTR criteria for metals were exceeded in the samples collected by Geosyntec, except that total copper slightly exceeded chronic criteria at Station 6 during the April 4, 2005, event.
- Selenium was detected only at Station 3 during the April 4, 2005, event and at Stations 1, 3, and 4 during the March 20, 2006, event.
- During the April 4, 2005, event, Station 3 exhibited the highest concentrations of conductivity, TDS, hardness, temperature, and total and dissolved arsenic, and was the only sampling station with detectable concentrations of selenium. Phosphate-phosphorous, TSS, and total and dissolved concentrations of arsenic and selenium were also highest at Station 3 during the March 20, 2006, event.
- During the March 20, 2006, event, Station 4 exhibited the highest concentrations of conductivity, salinity, total hardness, nitrate-nitrogen, sulfate, TDS, and total chromium.
- Station 4 exhibited the highest concentrations of salinity and TSS during the January 3, 2006, event. Station 4 was dry during the April 4, 2005, sampling event and was not sampled.
- Station 6 exhibited the highest concentrations of TSS, total chromium, total zinc, and total and dissolved copper during the April 4, 2005, event. Station 6 was dry during the March 20, 2006, event and was not sampled.
- Results from the sampling events generally indicated that the Tesla Coal Mine and the associated canyons were contributing substantial loads of TSS and sulfates to Corral Hollow Creek.
- Constituent concentrations in Corral Hollow Creek's main stem generally increased from the upstream end of the watershed study area (Station 12 – approximately 2 miles west of the SVRA) to the downstream end of the watershed study area (Station 1 – at the western end of the SVRA).
- The Basin Plan objectives for pH were not exceeded in any samples collected during the April 4, 2005, event, but were exceeded in a few samples collected during sampling events on January 3, 2006, and March 20, 2006.

Concentrations of aluminum, cadmium, and copper measured during the 2014 sampling events exceeded threshold limits; however, the aluminum and cadmium concentrations were identified as originating from off-site sources (i.e., the former Tesla Coal Mine and the LLNL Site 300). The elevated copper concentrations also occurred from these off-site sources, and from within the SVRA based on naturally occurring copper that is present in the underlying rock strata throughout the project area. The 2014 sampling results demonstrated that water quality from runoff leaving the SVRA through Corral Hollow Creek was either in compliance with all applicable water quality standards, comparable, or of better quality than runoff entering the SVRA via Corral Hollow Creek (State Parks 2015a:9–12).

2.3.1.4 Air Quality

The planning area is located on the border of Alameda and San Joaquin Counties. These counties are part of the San Francisco Bay Area Air Basin (SFBAAB) and San Joaquin Valley Air Basin (SJVAB), respectively.

Meteorological conditions in the SFBAAB are warm and mainly dry in the summers, and mild and moderately wet in the winters. Temperatures in eastern Alameda County are typical of the Bay Area's inland coast valleys, which are minimally affected by exposure to sea breezes. Summer high temperatures are hot, often exceeding 100 degrees Fahrenheit (ºF). The average maximum temperature during the summer (June to August) near the planning area is approximately 90ºF (WRCC 2016a). Winter temperatures are cool to cold, with minimum temperatures often dropping into the upper 30s. The average minimum temperature during the winter (November to February) is approximately 41ºF (WRCC 2016a). Livermore (which is located near the planning area) receives approximately 14 inches of annual precipitation, with most occurring in the winter months (WRCC 2016b).

The clear skies and relatively warm conditions that are typical in summer can combine with localized air pollutant emissions to elevate ground-level ozone levels. Air quality standards for ozone generally are exceeded when conditions remain relatively stagnant for periods of several days during the warmer months. Weak wind-flow patterns combined with strong inversions substantially reduce normal atmospheric mixing. Key components of ground-level ozone formation are sunlight and heat; therefore, substantial ozone formation occurs only during the months from late spring through early fall.

Because the planning area's meteorological conditions are conducive to a buildup of air pollutants and to the transport of air pollutants into the area from urbanized portions of both the Bay Area and the Central Valley, pollution potential is relatively high. Pollutants that are emitted in the SFBAAB's more urbanized areas and transported from urban or industrial areas can contribute to localized air quality problems. The light winds that are common in winter can combine with surface-based inversions caused by the presence of cold air near the surface, thus trapping pollutants such as particulates (e.g., wood smoke) and carbon monoxide (CO). This can lead to localized high concentrations of these pollutants.

The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. Precipitation and fog tend to reduce or limit concentrations of some pollutants. For instance, clouds and fog block sunlight, which is necessary to fuel photochemical reactions that form ozone. Because CO is partially water soluble, precipitation and fog also tend to reduce CO concentrations in the atmosphere. In addition, respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}) can be washed from the atmosphere through wet deposition processes such as rain. Between winter storms, however, high pressure and light winds lead to the creation of low-level temperature inversions and stable atmospheric conditions, resulting in the concentration of air pollutants (e.g., CO, PM_{10}).

The Bay Area Air Quality Management District (BAAQMD) and San Joaquin Valley Air Pollution Control District (SJVAPCD) attain and maintain air quality conditions in the Bay Area and San Joaquin Valley through comprehensive programs of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. Both the California Air Resources Board (ARB) and EPA designate areas according to their attainment status for criteria air pollutants. The three basic designation categories are nonattainment, attainment, and unclassified. Under the federal Clean Air Act (CAA), if an area is redesignated from nonattainment to attainment, a revision to the State Implementation Plan (SIP) called a maintenance plan must be completed to demonstrate how the air quality standard will be maintained for 10 years. (For more information about SIPs, see "Air Quality Regulations" in Section 2.7.3, "Regulatory Influences.")

The SFBAAB is currently designated by the State of California as a nonattainment area for ozone, PM_{10}, and fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), and as an attainment or unclassified area for all other pollutants. Based on national standards, the SFBAAB is designated as a marginal nonattainment area for ozone, nonattainment for 24-hour $PM_{2.5}$, and as an attainment or unclassified area for all other pollutants.

The SJVAB is currently designated by the State of California as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$ and as an attainment or unclassified area for all other pollutants. Based on national standards, the SJVAB is designated as an extreme nonattainment area for ozone and nonattainment for $PM_{2.5}$, and as an attainment or unclassified area for all other pollutants.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Adverse health effects caused by exposure to ozone primarily affect the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well.

PM_{10} consists of particulate matter emitted directly into the air, such as soot and smoke from mobile and stationary sources; natural windblown dust; dust generated by human activities such as construction operations; and fires. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death.

Many of the trails and riding areas at Carnegie SVRA have loose gravel, silt, and cobbles. When OHV use disturbs loose soils during the dry months, fugitive dust (up to PM_{10}) becomes airborne. The presence of geographic barriers and inversions that result in a stable atmosphere causes particulate matter to accumulate and achieve elevated concentrations, thus reducing visibility and increasing periods with potentially adverse health effects. The periods of greatest concern for elevated PM_{10} concentrations (the summer months) do not coincide with the periods of greatest OHV activity at Carnegie SVRA (the spring and fall). High average daily temperatures in the summer discourage the use of Carnegie SVRA. SVRA use tends to peak during the late spring and fall, when soils are not as dry and less likely to become airborne.

The fuel combustion required to operate OHVs at Carnegie SVRA creates exhaust emissions. These emissions include gases known as ozone precursors, which, when exposed to sunlight, react with other gases in the atmosphere to form ozone. The ozone precursors typically regulated are reactive organic gases and oxides of nitrogen (NO_X). Limiting either of these gases can also limit the amount of ozone produced in a given area. Typically, few OHVs have devices to control emissions, so all gases generated from the combustion of fuel are emitted to the atmosphere, including reactive organic gases and NO_X. The addition of ozone precursors contributes to the area's existing nonattainment status for ozone.

2.3.1.5 Climate Change

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion is reflected back toward space through the atmosphere. However, infrared radiation is selectively absorbed by GHGs in the atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated compounds. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change (IPCC 2021). The principal GHG pollutants that contribute to climate change are primarily emitted by the following emission sources:

- **Carbon Dioxide**: Natural sources of CO_2 include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; and evaporation from oceans. Anthropogenic (human) sources include burning of coal, oil, natural gas, and wood.

- **Methane**: CH_4 is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide**: Primary human-related sources of N_2O are agricultural soil management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.
- **Fluorinated gases**: These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes called High Global Warming Potential (High GWP) gases. These High GWP gases include:
  - Chlorofluorocarbons (CFC)s: These GHGs are used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants.
  - Perfluorinated Chemicals (PFCs): PFCs are emitted as by-products of industrial processes and are also used in manufacturing.
  - Sulfur hexafluoride (SF_6): This is a strong GHG used primarily as an insulator in electrical transmission and distribution systems.
  - Hydrochlorofluorocarbons (HCFCs): These have been introduced as temporary replacements for CFCs and are also GHGs.
  - Hydrofluorocarbons (HFCs): These were introduced as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are GHGs emitted as by-products of industrial processes and are also used in manufacturing.

Emissions of GHGs have the potential to adversely affect the environment because such emissions contribute cumulatively to global climate change. The precise quantity of GHGs that it takes to ultimately result in climate change is not known. No single project would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or microclimate changes. However, cumulative emissions from many projects and activities affect global GHG concentrations and the climate system, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years), or long enough to be dispersed around the globe. The potential for a particular greenhouse gas to absorb and trap heat in the atmosphere is considered its global warming potential (GWP). The reference gas for measuring GWP is CO_2, which has a GWP of one. By comparison, CH_4 has a GWP of 25, which means that one molecule of CH_4 has 25 times the effect on global warming as one molecule of CO_2.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. As noted in California's Fourth Climate Change Assessment, climate change is expected to make the Sacramento region hotter, drier, and increasingly prone to extremes like megadroughts, flooding, and large wildfires. These changing conditions are likely to affect water and energy availability, agricultural systems, plants and wildlife, public health, housing, and quality of life. In Sacramento County, primary effects of climate change include increased temperature, changes in precipitation patterns, and sea level rise and secondary consequences include increased frequency, intensity, and duration of extreme heat days and heat waves/events; loss of snowpack and decreased water supplies; increased wildfire; and increased flooding (Bedsworth, et. al. 2018).

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations; increased risks from invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration, range shift, and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss occurs).

Energy. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events, and sea level rise. Increasing temperatures and reduced snowpack negatively affect the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants since power plant cooling is less efficient at higher ambient temperatures.

Forestry. The most significant climate change related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and, combined with increasing temperatures, have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat, and decreased carbon absorption.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate longstanding challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities.

Public Health. Climate change can affect public health through various environmental changes. Changes in precipitation patterns affect public health primarily through potential for altered water supplies and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat-related illness, as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively affect air quality and increase or intensify respiratory illness such as asthma and allergies.

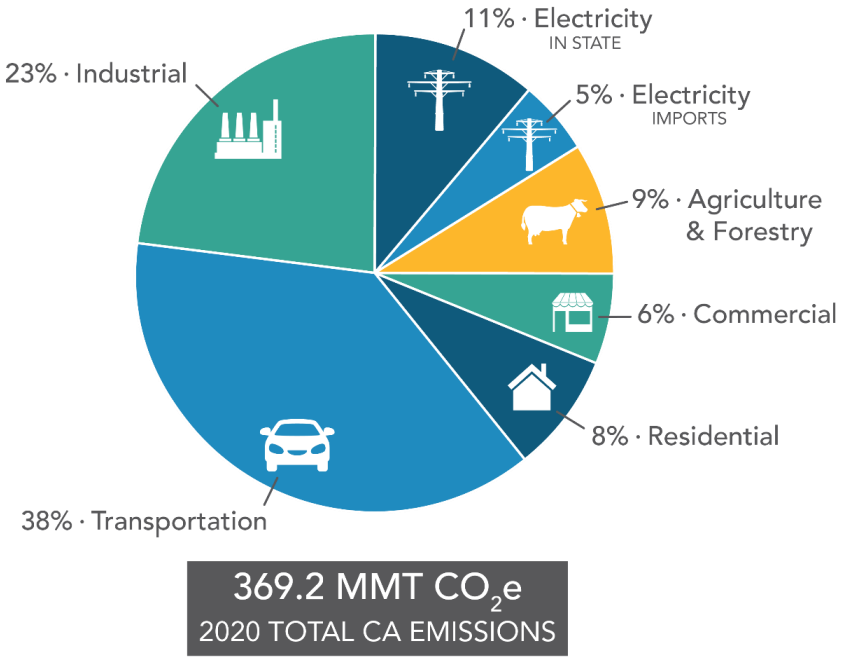
Transportation. Transportation is vulnerable to climate change risks, including sea level rise and erosion, which threaten many coastal California roadways, airports, seaports, transit systems, bridge supports, and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. Other forms of extreme weather events, such as extreme storm events, can negatively affect infrastructure, which can impair movement of people and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly affect the transportation system and pose a serious risk to public safety.

Water. Climate change could seriously affect the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can affect water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the wintertime. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively affect groundwater reserves and result in increased overdraft and subsidence.

Greenhouse Gas Emissions Inventory and Trends

At 83 percent of all CO_2 equivalent (CO_2e) emissions, fossil fuel combustion is the biggest source of GHG emissions in the U.S. since 1990 (EPA 2023). These emissions have decreased between 1990 to 2021 by 1.9 percent. Transportation-related GHG emissions represented 37.9 percent of all GHG emissions from fossil fuel combustion in 2021, and has trended upward since 1990 (EPA 2023).

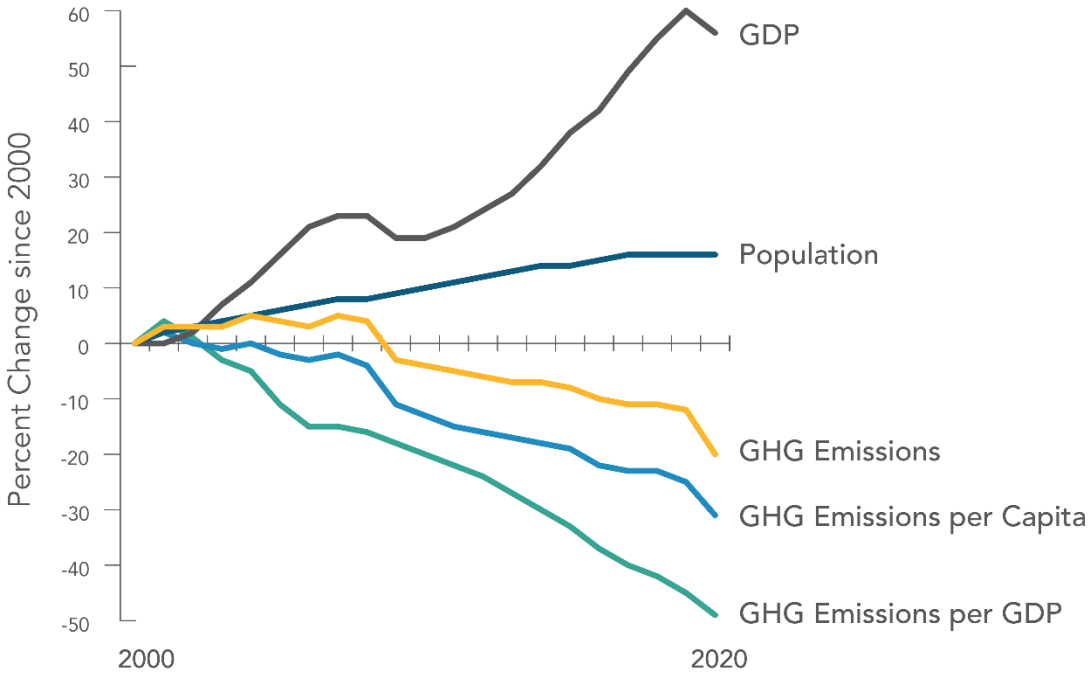
The ARB prepares an annual inventory of state-wide GHG emissions. GHGs are typically analyzed by sector, a term that refers to the type of activity. As shown in Figure 2-11, 369.2 million metric tons (MT) CO2e were generated in 2020. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2020, accounting for 38 percent of total GHG emissions, of which off-road and unspecified vehicles accounts for approximately 0.4 percent of total GHG emissions. Transportation was followed by industry, which accounted for 23 percent, and then the electric power sector (including in-state and out-of-state sources), which accounted for 16 percent of total GHG emissions (ARB 2022c).



Source: ARB 2022c

Figure 2-11. 2020 California Greenhouse Gas Emissions Inventory by Sector

California has implemented several programs and regulatory measures to reduce GHG emissions. Figure 2-12 demonstrates California's progress in reducing state-wide GHG emissions. Since 2007, California's GHG emissions have been declining, even as population and gross domestic product have increased. Per-capita GHG emissions in 2020 were 30 percent lower than the peak per-capita GHG emissions recorded in 2001. Similarly, GHG emissions per million dollars of gross domestic product have decreased by 50 percent since the peak in 2001.



Source: ARB 2022c

Figure 2-12. Trends in California Greenhouse Gas Emissions (Years 2000 to 2020)

2.3.2 Biotic Resources

The information in this section is based on regulatory agency information for the region about the status of special-status plants and wildlife; applicable regional planning and habitat management documents; and biological resources studies and impact analyses previously conducted in the planning area and at other nearby sites. These sources are listed below. Where applicable, a summary of the referenced document is provided below the document citation.

The following information sources and studies were used to inform the existing conditions of biological resources known or expected to occur in the planning area:

- California Natural Diversity Database (CNDDB), a statewide inventory of the locations and conditions of the state's rare plant and animal taxa and vegetation types (CNDDB 2022)
- USFWS database of endangered and threatened species (USFWS 2022)
- California Native Plant Society (CNPS) online inventory of rare and endangered plants (CNPS 2022a)
- Listed Observed Plant and Animal Species, Alameda-Tesla, Carnegie SVRA and LLNL Site 300 Properties (CNPS 2012)
- Results of vegetation mapping for the planning area (AECOM 2012)
- *Carnegie SVRA Roads and Sediment Basin Rehabilitation Projects, Initial Study/Mitigated Negative Declaration* (State Parks 2011)
- Wetland delineation of the planning area (TRA 2010a; MBI 2016) and subsequent verification by the U.S. Army Corps of Engineers (USACE) (2010; 2016)
- *Biological Assessment for Carnegie SVRA and Mitchell Ravine Projects* (TRA 2010b)
- Acoustic Bat Survey at Carnegie State Vehicular Recreation Area (The Wildlife Project 2016)
- Carnegie State Vehicular Recreation Area Delineation of State and Federal Jurisdictional Waters (State Parks 2016)

- Scientific Collecting Permit Annual Report: Amphibian and Reptile Species of Special Concern 2018 (State Parks 2019a)
- Habitat Use by Mountain Lions at Carnegie State Vehicular Recreation Area in Alameda and San Joaquin Counties, California (State Parks 2020a)
- Rodent Diversity and Population Dynamics in an Off-highway Vehicle Area (State Parks 2020b)
- 2020 Bird Survey Season Report: California State Vehicular Recreation Area Avian Monitoring for Habitat Conditions and Disturbance Effects (Cole and Siegel 2021)
- Carnegie State Vehicular Recreation Area Valley Elderberry Longhorn Beetle Survey (State Parks 2021a)
- Automated bird sound classifications of long-duration recordings produce occupancy model outputs similar to manually annotated data (Cole et al. 2022)
- Reconnaissance-level surveys conducted in the planning area by AECOM biologists in 2012
- Site tour, meetings, and correspondence with representatives of USFWS, CDFW, and the Central Valley RWQCB during General Plan formulation
- *East Alameda County Conservation Strategy* (EACCS) (EACSSC 2010) The purpose of the EACCS is to preserve endangered species by developing long-term habitat protection measures. Contributors include the Cities of Dublin, Livermore, and Pleasanton; Alameda County; EBRPD; the San Francisco Bay RWQCB; USFWS; and CDFW. The EACCS will assess areas across eastern Alameda County for their conservation value and establish guiding biological principles for conducting conservation in the county.
- *Managing Rangelands to Benefit California Red-legged Frogs and California Tiger Salamanders.* (Ford et al. 2013) The aim of this document is to provide management recommendations for rangelands to support the long-term existence of both the California red-legged frog and the California tiger salamander. The recommendations are based on the best available information of existing scientific research on these two species and the expertise of individuals who study or manage the species' habitat.
- Alameda County Voluntary Local Program (Alameda County Resource Conservation District 2012). This voluntary program recognizes the unique and important role that private landowners in California play in wildlife and habitat enhancement. The purpose of this program is "to encourage farmers and ranchers engaged in agricultural activities to establish locally designed programs to voluntarily enhance and maintain habitat for endangered and threatened species" (Alameda County Resource Conservation District 2012). The program provides guidelines for management activities that will preserve or improve habitats for listed and sensitive species, including pond and stream restoration. The program also provides take coverage for covered species including California tiger salamander and Alameda whipsnake for management activities conducted as part of the program.
- *A Guidebook to Botanical Priority Protection Areas of the East Bay* (Bartosh et al. 2010) This purpose of this document is to identify important botanical areas in Alameda and Contra Costa Counties that should be considered for protection in local planning efforts, and to increase awareness of key habitats among land management agencies and local jurisdictions. The guidebook identifies 15 Botanical Priority Protection Areas located on 96,932 acres in Alameda County and 141,293 acres in Contra Costa County. These areas were selected based on their potential high diversity of native plants and habitats, the known or potential presence of sensitive botanical resources, and threats from current or proposed land use decisions. Some of the planning area is within an area identified in the guidebook as the Corral Hollow Botanical Priority Protection Area, based on the presence of locally uncommon plant species and CNDDB plant occurrences. Although this guidebook is not a regulatory document and does not represent a legal designation of priority conservation areas, it was reviewed for relevant botanical resources information to be considered in development of this General Plan.
- *Watershed Facilities Maintenance Project Biological Assessment* (State Parks 2005a)
- *Inventory, Wildlife Habitat Protection Program, and Monitoring Program for Carnegie State Vehicular Recreation Area, Tracy, CA* (Kutilek et al. 1990)

- *Amphibian and Reptile Species of Special Concern in California* (Jennings and Hayes 1994)
- *Carnegie SVRA Inventory of Features* (State Parks 1980)
- Habitat Monitoring System (HMS) reports for Carnegie SVRA (State Parks n.d.[a] through n.d.[e], 2005b) and HMS data from surveys conducted during 2011 through 2014 (State Parks 2015a). A detailed wildlife and habitat inventory and monitoring plan was developed for each SVRA unit, including Carnegie. These reports gave a thorough baseline inventory of the units and recommended future monitoring procedures and strategies. State Parks conducts annual monitoring and reporting of its holdings. The HMS was originally designed and implemented in the 1990s and was updated in 2009 based on an independent review by the University of California, Davis (UCD).
- The Wildlife Habitat Protection Plan (WHPP) Framework (State Parks 2021b) provides a framework all SVRA's future plans. The WHPP details a broad range of scientifically accepted techniques and measures that are appropriate for the unique habitats found within each SVRA. This monitoring system provides information on protocols for baseline studies, focused studies, monitoring, and surveys, and is used by SVRA resource managers to aid in the development of park-specific monitoring plans and techniques. The WHPP will supersede the HMS once finalized.

2.3.2.1 Vegetation

Vegetation in the planning area was mapped by AECOM in 2012, and by State Parks in 2021 and 2022, specifically in support of the planning process. Multiple sources were used: previous vegetation mapping efforts in the planning area (State Parks 1980, 2000) and the *Existing Vegetation* (i.e., Eveg) maps; aerial imagery interpretation; and field verification and refinement (AECOM 2012, State Parks 2022). Special-status plants within Carnegie SVRA were mapped by MIG, Inc. in 2016.

In addition, floristic surveys were conducted throughout the planning area for 32 days between March 18 and July 24, 2003, and for 3 additional days between October 24 and November 4, 2003 (Ecosystems West 2004). Floristic surveys of select locations were conducted by AECOM and TRA Environmental Sciences during March, April, and May 2014. The most recent round of floristic surveys was conducted throughout the planning area by State Parks between May 3 and May 6 of 2021, with an accuracy assessment conduction on March 17, 2022.

A delineation of wetlands and other waters of the United States has been conducted for the entire planning area in 2010 and 2016 (TRA 2010a; MBI 2016) and verified by USACE (2010; 2016). Geographic information system (i.e., GIS) shape files from both the 2010 USACE-verified wetland delineation and ground-verified and refined vegetation layers were used to compile the vegetation map (Figure 2-13).

Vegetation Classification

Vegetation nomenclature generally follows *A Manual of California Vegetation* (MCV) (CNPS 2022b) classification system, but modifications were applied to account for site-specific variability as necessary. The MCV has been developed as a standardized statewide classification system to facilitate coordination and data sharing among agencies and nongovernmental conservation organizations, as required by Senate Bill 85 and California Fish and Game Code Section 1940.

The MCV has been developed in compliance with the National Vegetation Classification System and Ecological Society of America standards. Using this standardized classification system will make the data more compatible across administrative boundaries and facilitate conservation and management coordination at the local, regional, and state levels. In addition, using standardized state nomenclature compatible with the National Vegetation Classification System allows agencies to track the rarity and imperilment of vegetation types. Consistent with the MCV, the vegetation classification unit applied here is "vegetation type" rather than "vegetation community" or "plant community." Unvegetated and developed areas are described in terms of land cover types (e.g., developed, disturbed).

The CDFW manages the Vegetation Classification and Mapping Program (VegCAMP) which develops and maintains a standard classification system and mapping methodology. This methodology is being

employed statewide to meet the legislative goal of mapping the entire state of California. To date, approximately 60% of the state has been mapped with these methods. Data, reports, and maps may be found on the BIOS viewer (CDFW 2023a), the VegCAMP website (CDFW 2023b) and via the Manual of California Vegetation (MCV) online (CNPS 2022b).

Vegetation types were mapped to the alliance level. The alliance level is based on diagnostic species from the primary layer (e.g., the tree layer in the case of a woodland alliance) and is a finer scale in the National Vegetation Classification hierarchy than the group level, which is based on formation type (e.g., forest, woodland, scrub) and foliage (e.g., broadleaf, deciduous). However, the alliance level is coarser than the association level, which is based on diagnostic species in multiple layers, not just the primary layer. The association level may be most appropriate for small, local sites, and the alliance level is usually recommended for regional or state-level mapping. The alliance level is appropriate for meeting the management objectives of State Parks for preparing the General Plan and associated environmental impact report.

Vegetation Types

The planning area is an ecologically transitional area that straddles the Coast Ranges and supports vegetation typical of both coast and inland communities (State Parks 1980:P-4). In total, 14 vegetation types are present in the planning area. (Table 2-8). As described below, these vegetation types include California juniper forest, buckeye forest, blue oak forest, Fremont cottonwood forest, desert olive, mulefat, bush mallow, black sage, California sage brush, California annual and perennial grassland, and purple needlegrass. Developed and barren areas are also present. The planning area also contains water bodies consisting of ponds, seeps, and linear drainages (Figure 2-13).

California juniper woodland alliance

California juniper (*Juniperus californica*) woodland alliance covers approximately 14 acres of the planning area. This type is mapped in areas where California juniper cover is dominant (>50% relative cover) in the tree stratum, with blue oak as the second highest cover. At Carnegie SVRA, juniper is often mixed with blue oak, but there are only a few small stands where juniper cover is higher than blue oak.

Buckeye forest and woodland alliance

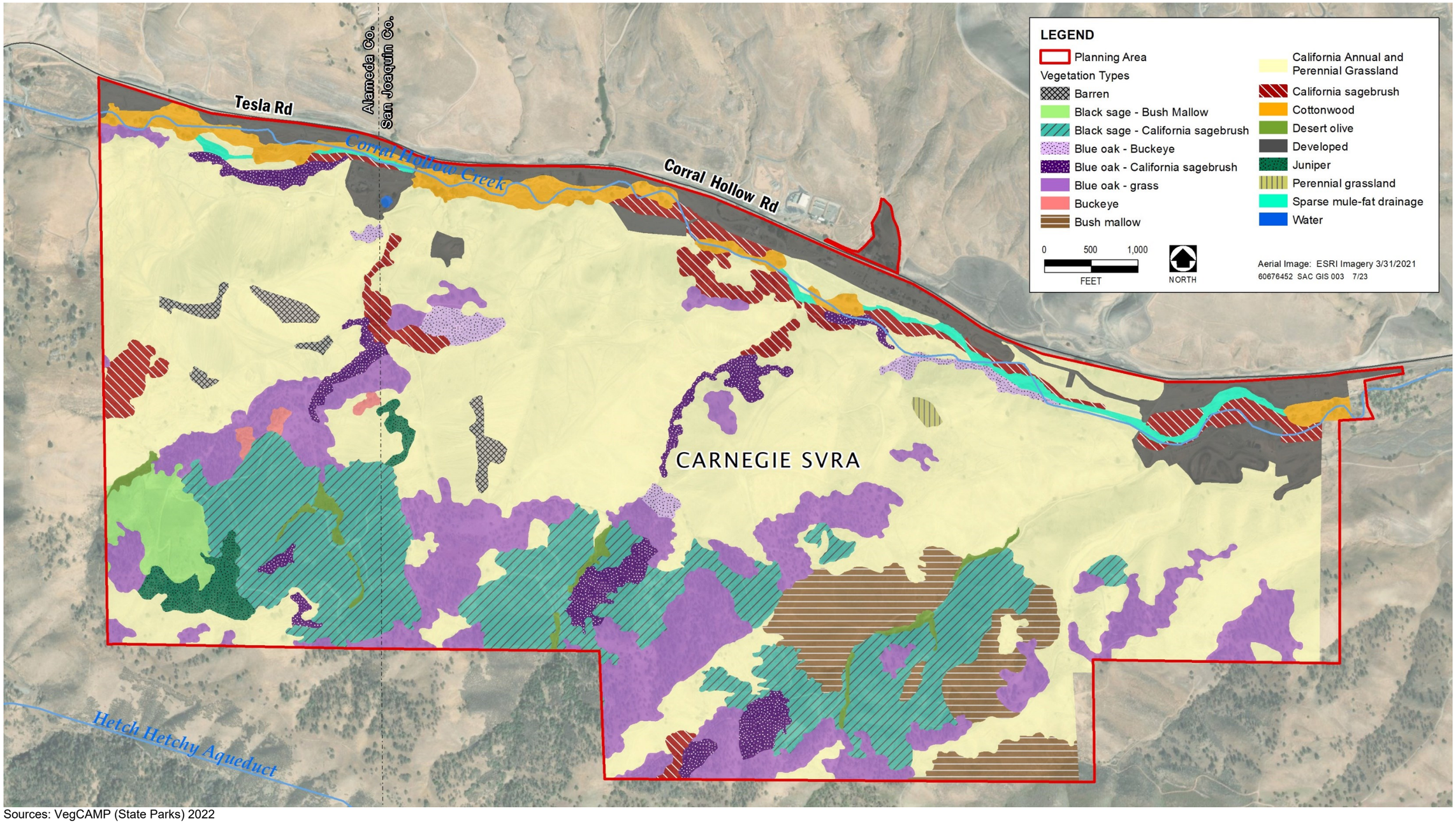
Buckeye (*Aesculus californica*) forest and woodland alliance grows covers approximately 3 acres in the planning area. This type is mapped when buckeye is dominant in the tree canopy. Blue oak may also be present. The shrub layer is sparse and the herbaceous layer is generally dominated by non-native grasses, with native forbs present in the spring.

Blue oak / mixed herbaceous association

Blue oak (*Quercus douglasii*) / mixed herbaceous association grows extensively throughout the planning area and covers approximately 194 acres in the planning area. This type is mapped where blue oaks occur over a grassy or herbaceous understory. Blue oak is the dominant species in the tree stratum, but California juniper and buckeye are also present at low cover. If buckeye reaches >30% relative cover, see the blue oak – buckeye association. The canopy may be intermittent to continuous, or savannah-like, where tree cover is as low as 5% absolute cover but is spatially consistent. The shrub layer is <10% (if higher, see the blue oak / shrub association), and is usually dominated by California sagebrush (*Artemisia californica*). The understory is herbaceous, generally dominated by non-native grasses with native forbs present in the spring. Blue oak - buckeye / grass association.

Blue oak / buckeye association

Blue oak – buckeye / grass association covers approximately 13 acres in the planning area. This type is mapped when blue oaks and buckeyes are co-dominant in the tree canopy, with a similar understory as in the blue oak / grass association. If buckeye relative cover is >50%, map as the buckeye alliance.



Sources: VegCAMP (State Parks) 2022

Figure 2-13. Habitat Types Found at Carnegie SVRA

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Table 2-8. Acreage of Vegetation Types in the Planning Area

	NVCS Name	State Rarity Ranking	Sensitive ?	Common Name Map Label	Total Acres
Tree Overstory (Woodland / Forest) Vegetation	*Juniperus californica* woodland alliance	S4	No	California juniper	13.9
	Populus fremontii - Fraxinus velutina - Salix gooddingii forest and woodland alliance	S3	Yes	Fremont cottonwood	35.4
	Aesculus californica forest and woodland alliance	S3	Yes	Buckeye	2.9
	Quercus douglasii forest and woodland alliance	S4	No	Blue oak	
	- *Quercus douglasii* / Mixed herbaceous association	S4	No	Blue oak / grass	194.4
	- *Quercus douglasii - Aesculus californica* / grass association	S4	No	Blue oak - Buckeye	13.3
	- *Quercus douglasii / Ericameria linearifolia* association	S4	No	Blue oak / shrub	37.5
Shrubland Vegetation	*Rhus trilobata - Crataegus rivularis - Forestiera pubescens* shrubland alliance	S3.2	Yes	Desert olive	9.6
	Baccharis salicifolia shrubland alliance	S4	No	Mulefat	12.3
	Malacothamnus fasciculatus - Malacothamnus spp. shrubland alliance	S4	No	Bush mallow	60.9
	Salvia mellifera – Artemisia californica alliance	S4	No	Black sage - California sagebrush	195.9
	- *Salvia mellifera - Malacothamnus fasciculatus* association	S3	Yes	Black sage - Bush mallow	21.1
	Artemisia californica - Salvia leucophylla shrubland alliance	S5	No	Purple sage- California sagebrush	
	- *Artemisia californica* association	S5	No	California sagebrush	49.8
Herbaceous Vegetation	California annual and perennial grassland macrogroup	-	N/A	California annual and perennial grassland	761.8
	Nassella spp. - *Melica* spp. alliance	S3S4	Yes	Purple needlegrass	1.5
Non-Vegetated	Barren	-	N/A	Barren	11.1
	Developed	-	N/A	Developed	90.1
	Water	-	N/A	Water	0.3
TOTAL					1,512

[1] A fire denuded a portion of the grassland in August 2015 (Tesla Fire). As a wildfire is considered a natural phenomenon, natural regeneration of the burned grassland is expected to occur over time.

Source: State Parks 2022

Blue oak / interior goldenbush association

Blue oak / interior goldenbush (*Ericameria linearifolia*) covers approximately 38 acres in the planning area. This type is mapped when blue oaks are dominant in the tree stratum and are >10% absolute cover, and there is significant (>10%) shrub cover in the understory. At Carnegie SVRA, the shrubs in the understory for this type are most commonly California sagebrush, and black sage. Narrow-leaf goldenbush is sometimes present at low cover, as is chaparral honeysuckle (*Lonicera subspecies* var. *denudata*). This is the most appropriate association for this vegetation type currently defined in the MCV, although its documented occurrences usually have higher cover of interior goldenbush than California Sagebrush in the shrub layer (Buck-Diaz and Evens 2011, CNPS 2022b).

Fremont cottonwood forest and woodland alliance

Fremont cottonwood (*Populus fremontii*) forest and woodland alliance grows along Corral Hollow Creek, which is seasonally wet and covers approximately 35 acres. This wetland type is characterized by Fremont cottonwood in the tree layer. The shrub canopy is absent or may have sparse cover of mulefat (*Baccharis salicifolia*). The herbaceous layer may be sparse to intermittent and tends to be weedy. Cottonwoods must be at least 5% absolute cover in order to meet the membership rules of this alliance. The alliance is mapped in patchy stands since cottonwood cover is not consistently high enough along the entire creek corridor to qualify as a stand.

Desert olive shrubland alliance

Desert olive (*Forestiera pubescens*) shrubland alliance is a semi-wetland vegetation type that grows in draws and drainages at the park, often extending up adjacent slopes and covers approximately 10 acres in the planning area. At Carnegie SVRA, stands of this type are strongly dominated by desert olive, with additional cover of elderberry (*Sambucus nigra* ssp. *caerulea*), coyote brush (*Baccharis pilularis*), and poison oak (*Toxicodendron diversilobum*). The shrub canopy is dense and there is little herbaceous understory.

Mulefat shrubland alliance

Mulefat (*Baccharis salicifolia*) shrubland alliance is a wetland vegetation type that grows in Corral Hollow Creek, in between Fremont cottonwood stands and covers approximately 12 acres in the planning area. Shrub cover is sparse and patchy, and the herbaceous layer may be sparse to intermittent and tends to be weedy. Tree tobacco (*Nicotiana glauca*), a non-native invasive species, may be present in more disturbed areas. California poppy (*Eschscholzia californica*) patches are characteristic in the spring.

Bush mallow shrubland alliance

Bush mallow (*Malacothamnus fremontii*) shrubland alliance grows on the southeastern portion of the planning area, on slopes that had burned in the June 2019 Hollow fire, two years prior to surveys. This shrub alliance covers approximately 61 acres in the planning area. This shrub alliance is mapped in areas where bush mallow (*Malacothamnus fremontii*) is strongly dominant (>60% relative cover). Yerba santa (*Eriodictyon californicum*) and bush monkeyflower (*Diplacus aurantiacus*) may occur at low cover. Note that *Malacothamnus fremontii* is the species of bush mallow that occurs at Carnegie SVRA, and *Malacothamnus fasciculatus* is not present at the park. The herbaceous layer is sparse but may include non-native grasses or fire-following forbs.

Black sage – bush mallow association

Black sage (*Salvia mellifera*) – bush mallow association grows in the southwestern portion of the planning area on slopes that had burned in the August 2015 Tesla fire, six years prior to surveys. The herbaceous layer is sparse and consists mostly of non-native grasses. This shrub association covers approximately 21 acres in the planning area. This shrub association is mapped when black sage (*Salvia mellifera*) and bush mallow (*Malacothamnus fremontii*) together add up to >60% relative cover. California sagebrush (*Artemisia californica*) may be present at lower cover.

Black sage – California sagebrush alliance

Black sage – California sagebrush alliance grows on moderate to steep slopes throughout the planning area and covers approximately 196 acres in the planning area. This shrub alliance is mapped when black sage and California sagebrush together add up to >60% cover. Bush mallow may also be present at lower cover, or the three species may have nearly equal cover in the shrub canopy. Generally, more bush mallow is present in areas that burned more recently, and over time following a fire the community shifts to higher proportions of black sage and California sagebrush. The herbaceous layer is sparse and consists mostly of non-native grasses.

California sagebrush association

California sagebrush association covers approximately 50 acres in the planning area. This shrub association is mapped when California sagebrush is >60% relative cover in the shrub layer. Note that although this association is within the *Artemisia californica - (Salvia leucophylla)* shrubland alliance, *Salvia leucophylla* is not present at Carnegie SVRA. The herbaceous layer is sparse to dense and consists of non-native grasses and native forbs.

Purple needlegrass alliance

Purple needlegrass (*Nasella pulchra*, also known as *Stipa pulchra*) alliance covers approximately 1.5 acres in the planning area. There is one patch of purple needlegrass in the eastern northeastern portion of the planning area. This type was mapped where purple needlegrass was characteristic and at least 2% absolute cover, over an acre or more. This type was mapped in a restoration area where *N. pulchra* likely came from a seed mix. Information for this stand was informed by 2021 native grassland surveys (MIG 2021).

California annual and perennial grassland macrogroup

Most of the grassland at the park is mapped as this type, except for the native stand described above. This macrogroup accounts for 762 acres within the park. Grassland species composition and abundance varies spatially and temporally, and alliances and associations assemble in small stands that are difficult to distinguish in imagery. California's annual grasslands generally have a high percentage of nonnative annual grasses and forbs, but native wildflowers are an important yet often-overlooked component of the community. Annual grasslands are composed of a diverse assemblage of native and nonnative annual grasses and native and nonnative forbs. The forbs are predominantly annuals, but many are perennials, especially members of the lily family. Annual brome grassland is normally dominated by a mix of nonnative annual grasses and forbs, including soft chess (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), mouse barley (*Hordeum murinum*), slender wild oats (*Avena barbata*), annual fescue (*Festuca myuros*), Maltese star thistle (*Centaurea melitensis*), burclover (*Medicago polymorpha*), and black mustard (*Brassica nigra*).

Within the planning area, the soil is highly disturbed by OHV traffic and the annual brome grassland is dominated mainly by these nonnative annual grasses and forbs. Native wildflowers documented in grasslands in the planning area include California goldfields (*Lasthenia californica*), California poppy (*Eschscholzia californica*), valley tassels (*Castilleja attenuata*), brodiaea (*Brodiaea* spp. and *Triteleia* spp.), and lupines (*Lupinus* spp.). In less disturbed stands of annual grassland, native grasses can also be found, including purple needle grass, nodding needle grass (*Stipa cernua*), one-sided bluegrass (*Poa secunda* ssp. *secunda*), California melic (*Melica californica*), and small fescue (*Festuca microstachys*). In some instances, native grasses are fairly abundant; however, no stands of native grasses large enough to map as a native grassland vegetation type have been discovered, and these species occur in association with the more dominant nonnative annual grasses.

Barren

Polygons were designated "Barren" when there was <2% vegetation cover on native substrate across the minimum mapping unit of 1 acre. This land cover type covers approximately 11 acres in the planning area.

Developed

Developed areas include roads, buildings, parking lots, tracks, and campgrounds and covers approximately 90 acres in the planning area.

Water

There are a few designated ponds in the park but only one had visible standing water in the 2020 aerial imagery. Years with more rainfall may have more water polygons. Water covers approximately 0.3 acre within the planning area.

Pond

Nine vegetated and unvegetated basins cover approximately 1.65 acres of the planning area. Most of these ponds are characterized by open water, with sparse upland vegetation along the perimeter, and are seasonally dry. Some of the perennial ponds support emergent wetland vegetation, such as cattails (*Typha* spp.) and floating aquatic plants. A few support willows (*Salix* spp.) or riparian vegetation similar to that found in Fremont cottonwood forest and mule fat thickets.

Drainage

Drainages are distributed throughout the planning area:

- *Ephemeral drainages* in the planning area are narrow and the vegetation in the channels is the same as the surrounding upland vegetation.
- *Corral Hollow Creek* is a wide and braided channel dominated by Fremont cottonwood forest and mule fat thickets.

2.3.2.2 Common Wildlife

The planning area supports a variety of common and special-status wildlife species within the habitat types summarized previously. Common wildlife species known or expected to occur are based on previous studies conducted on-site including habitat monitoring reports by State Parks, biological assessments prepared for specific projects at Carnegie SVRA, habitat assessments and vegetation mapping performed by AECOM in 2012, species specific surveys conducted between 2016 and 2020, and studies performed on adjacent properties.

The following is a partial list of the non-special-status wildlife species commonly observed in the planning area:

- Northern pacific rattlesnake (*Crotalus oreganus*)
- Western fence lizard (*Sceloporus occidentalis*)
- Western whiptail (*Cnemidophorus tigris*)
- Pacific chorus frog (*Pseudacris regilla*)
- American robin (*Turdus migratorius*)
- Acorn woodpecker (*Melanerpes formicivorus*)
- House finch (*Carpodacus mexicanus*)
- Common raven (*Corvus corax*)
- California scrub jay (*Aphelocoma californica*)
- California quail (*Callipepla californica*)
- California thrasher (*Toxostoma redivivium*)
- Western meadowlark (*Sturnella neglecta*)
- Oak titmouse (*Baeolophus inornatus*)
- Red-tailed hawk (*Buteo jamaicensis*)
- Black-tailed jackrabbit (*Lepus californicus*)
- Coyote (*Canis latrans*)
- Mule deer (*Odocoileus hemionus*)

2.3.2.3 Special-Status Species

Special-status species are plants and animals that fall into any of the following categories:

- Species officially listed by the State of California or the federal government as endangered, threatened, or rare
- Candidate species for state or federal listing as endangered or threatened
- Species proposed for listing under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA)
- Taxa (i.e., taxonomic categories or groups) that meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA) Guidelines

- Species identified by CDFW as species of special concern
- Species listed as Fully Protected under the California Fish and Game Code
- Species protected by the Bald and Golden Eagle Protection Act
- Taxa considered by CDFW to be "rare, threatened, or endangered in California" and assigned a California Rare Plant Rank (CRPR). The CDFW system uses the following five rarity and endangerment ranks to categorize plant species of concern:
  - CRPR 1A—Plants presumed to be extinct in California
  - CRPR 1B—Plants that are rare, threatened, or endangered in California and elsewhere
  - CRPR 2A—Plants that are presumed extirpated in California, but are more common elsewhere
  - CRPR 2B—Plants that are rare, threatened, or endangered in California but more common elsewhere
  - CRPR 3—Plants about which more information is needed (a review list)
  - CRPR 4—Plants of limited distribution (a watch list)

All plants with a CRPR are considered "special plants" by CDFW. The term "special plants" is a broad term used by CDFW to refer to all plant taxa inventoried in CDFW's CNDDB, regardless of their legal or protection status. Plants ranked as CRPR 1A, 1B, 2A, or 2B may qualify as endangered, rare, or threatened species within the definition presented by CEQA Guidelines Section 15380. CDFW recommends, and local governments may require, that CRPR 1A, 1B, and 2 species be addressed in CEQA projects. In general, CRPR 3 and 4 species do not meet the definition of endangered, rare, or threatened pursuant to CEQA Guidelines Section 15380; however, these species may be evaluated by the lead agency on a case-by-case basis to determine significance criteria under CEQA.

CDFW applies the term "California species of special concern" to wildlife species that are not listed under the federal ESA or the CESA, but that are nonetheless declining at a rate that could result in listing, or that historically occurred in low numbers and are currently experiencing known threats to their persistence.

The CNDDB and data from site-specific inventories were used as the primary tools for researching the potential occurrence of special-status species and sensitive habitats in or near the planning area. The CNDDB, maintained by CDFW, is a statewide database of the status and documented locations of all rare, threatened, endangered, and special-status species in California. The CNDDB is not a comprehensive inventory of the presence or absence of all rare species, and a lack of records of a particular species at a particular location is not evidence that the species does not exist at that location. For any given location, a lack of species records may mean that the location has not been surveyed, or that species observations have not been reported to the CNDDB. A CNDDB records search was conducted for a 12-quadrangle search area centered on the Midway and Cedar Mountain 7.5-minute USGS quadrangles (CNDDB 2022). The CNPS inventory of rare and endangered plants of California (CNPS 2022a) was also reviewed for the same 12-quadrangle search area in support of the planning process and the Consortium of California Herbaria (2022) was also reviewed for special-status plant records in the planning area and vicinity. The USFWS species list generator and the USFWS critical-habitat mapper were used as secondary resources to identify species that could occur within or near the planning area.

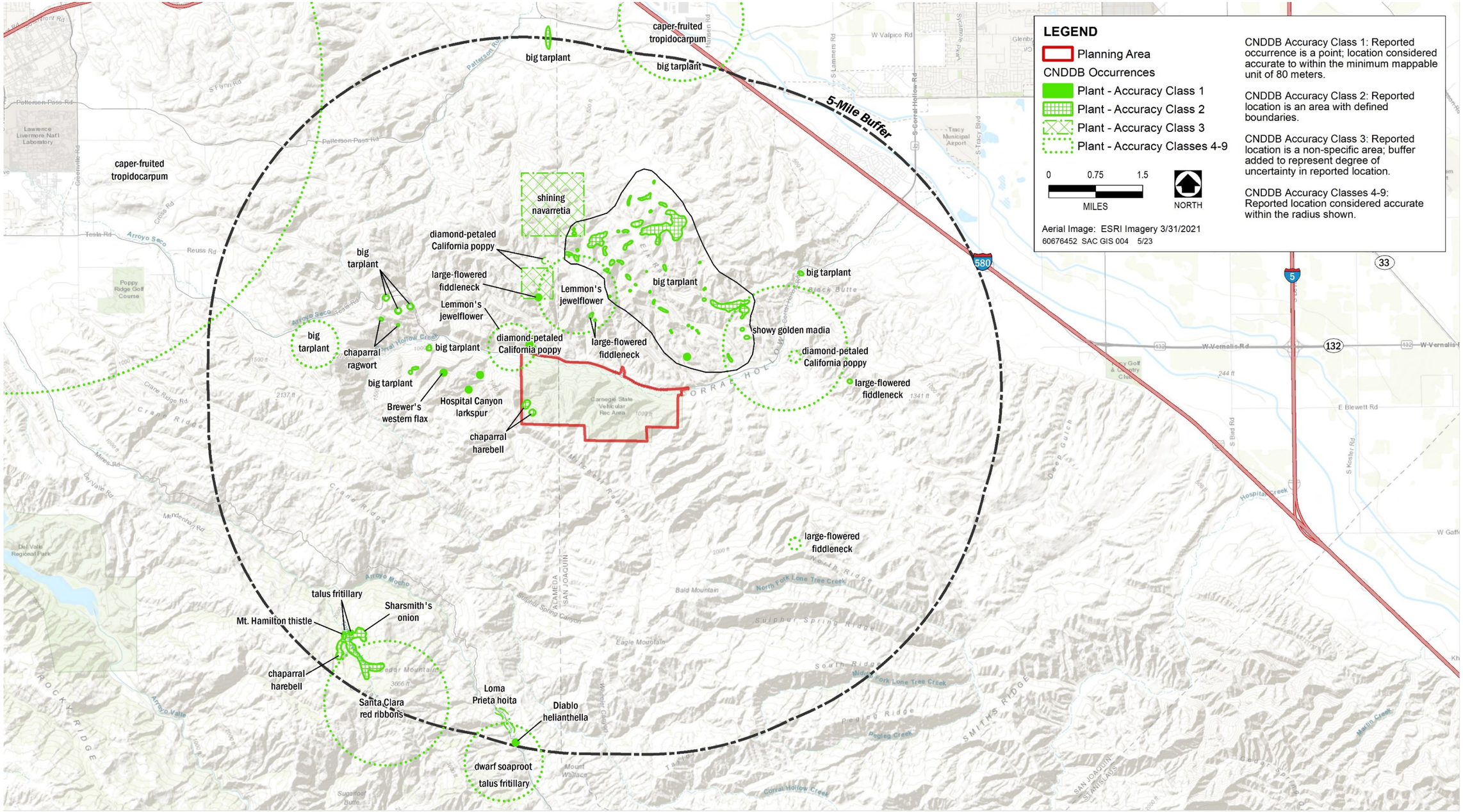
Several special-status plant and wildlife species known to occur in Alameda and San Joaquin Counties or documented in the 12-quadrangle search area were eliminated from further consideration in this document. These species were eliminated either because they are restricted to particular habitat types not found in the planning area (e.g., vernal pools, saltwater marshes, alkali meadows and seeps, alkali scalds, serpentine barrens, serpentine chaparral), or because their known distribution is limited to areas outside of the planning area (e.g., the floor of the Central Valley, the Sacramento–San Joaquin Delta, or the San Francisco Bay shoreline).

Special-Status Plants

Surveys for special-status plant species have been conducted in the planning area (State Parks 2000; Ecosystems West 2004; MIG 2016). Ecosystems West botanists conducted floristic surveys throughout the planning area for 32 days between March 18 and July 24, 2003, and for 3 additional days between October 24 and November 4, 2003. AECOM and TRA Environmental Sciences revisited the locations of previously recorded special-status plant occurrences during March, April, and May 2014. MIG, Inc. conducted surveys in March, April, May, and September of 2016.

These survey results and CNDDB records have documented 5 species in the planning area and an additional 13 species within 5 miles. The distribution of CNDDB records of special-status plant species occurrences documented within 5 miles of the planning area is shown in Figure 2-14. Special-status plant occurrences located during Jones and Stokes 1998 surveys were reported to the CNDDB and are included in Figure 2-14. Special-status plant occurrences documented by Ecosystems West in 2003, by AECOM/TRA Environmental Sciences in 2014, and MIG, Inc in 2016 are depicted in Figure 2-15. Table 2-9 lists all special-status plant species known to occur on or within 5 miles of the planning area based on CNDDB and CNPS records and previous plant survey results. No state-listed or federally listed plant species have been documented in the planning area. The large-flowered fiddleneck (state and federally listed as endangered) is the only listed species that has been documented within 5 miles of the planning area. Critical habitat for large-flowered fiddleneck has been designated immediately north of Carnegie SVRA (IPaC, USFWS). The U.S. Bureau of Reclamation has drafted a plan to introduce this species within its historic range in eastern Contra Costa County and western San Joaquin County (and possibly eastern Alameda County), including areas adjacent to the planning area on the north side of Corral Hollow Road (Vollmar Consulting 2013).

Shredding evening primrose (*Eremothera boothii* ssp. *decorticans*), a plant species considered locally rare by the East Bay chapter of CNPS, but having no legal status or CRPR, has also been found within California sagebrush/black sage scrub habitat in the planning area (Bartosh et al. 2010). The East Bay CNPS chapter identified an 8,974-acre area that includes portions of the planning area as a Botanical Priority Protection Area. This finding is based on records of big tarplant, shredding evening primrose, Lemmon's jewelflower, and rayless ragwort, and on a historical (1937) record of green fiddleneck (*Amsinckia vernicosa*) (Bartosh et al. 2010), another species that is locally uncommon but has no legal status or CRPR. There are a total of three records of green fiddleneck from Alameda County and seven records from San Joaquin County, including a 1989 record from LLNL (Consortium of California Herbaria 2023). Species identified by the East Bay Chapter of CNPS have no legal designation as special-status species and evaluation of these species in CEQA documents is at the discretion of the lead agency.



Source: California Natural Diversity Database 2022

Figure 2-14. Special-Status Plant Species Occurrences within a 5-Mile Search Radius

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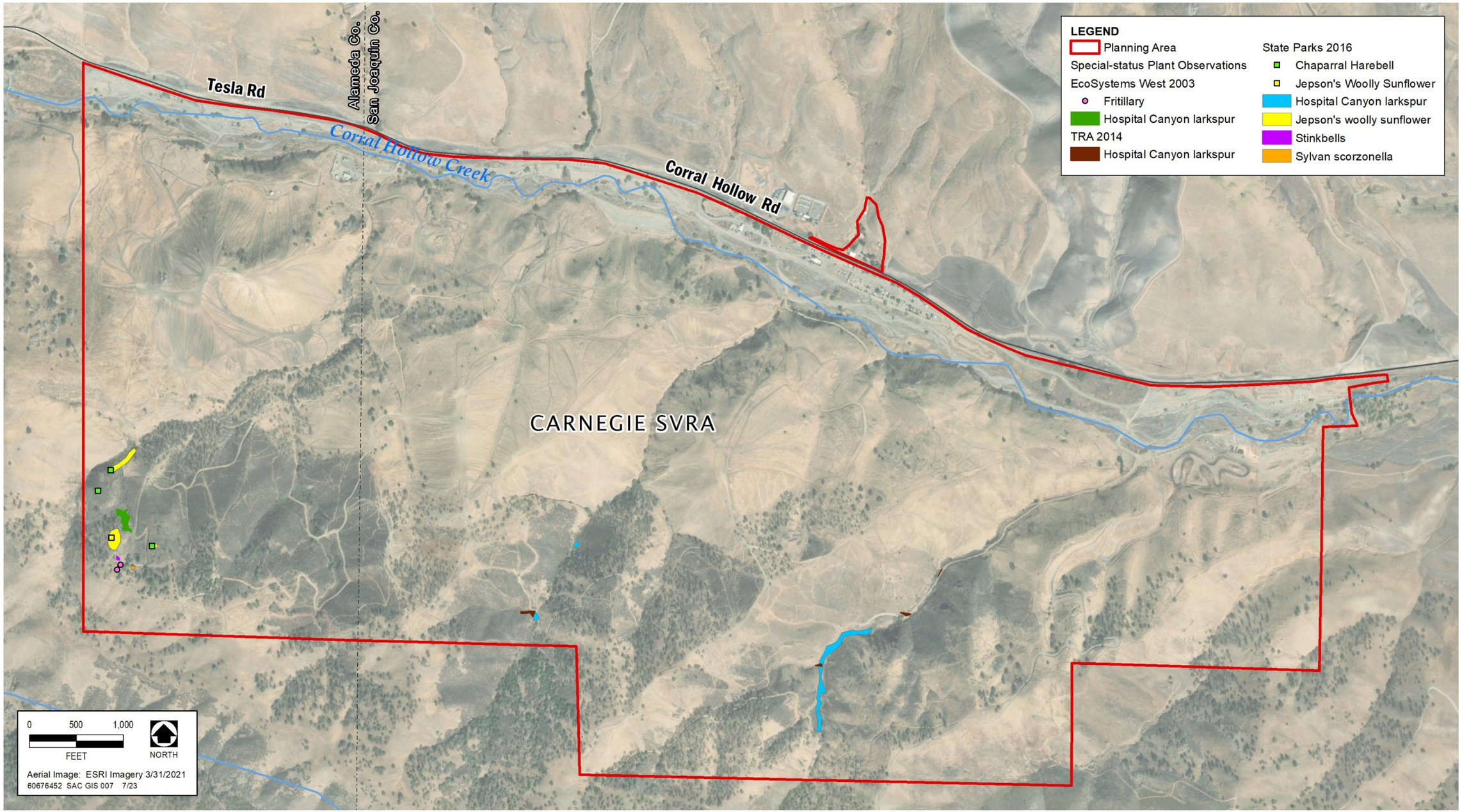

Sources: Ecosystems West 2004, TRA 2014, State Parks 2016

Figure 2-15. Special-Status Plant Species Occurrences within the Planning Area

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Table 2-9. Special-Status Plant Species Documented in and Near the Planning Area – Species Within the Planning Area

Species	California Rare Plant Rank*	Comments
Forked hareleaf *Lagophylla dichotoma*	1.B.1	The woodland communities and grasslands provide potentially suitable habitat for this species. It was observed in the planning area in 2003, but specific locations were not recorded because the species was not listed in the CRPR system at that time. Taxonomic changes made since the surveys in 2003 indicate the species identified in the planning area may actually be *L. diabloensis*, a CRPR 1B.2 species.
Chaparral harebell *Campanula exigua*	1B.2	This species grows in rocky places in chaparral, usually in serpentinite soils. Suitable habitat may be present in rocky outcrops within the planning area. The fire-prone chaparral hillsides within the planning area provide suitable habitat for this species. It was observed within the black sage – bush mallow vegetation community during the 2016 surveys. This area had burned during the August 2015 Tesla fire.
Hospital Canyon larkspur *Delphinium californicum* ssp. *interius*	1.B.2	Openings in the scrub communities and moist areas in the woodland communities provide potentially suitable habitat for this species. It has been documented at six locations in the planning area, including two locations initially identified by Ecosystems West in 2003. The species was observed at one of these locations in 2014, but there were fewer plants occupying a much smaller area than recorded in 2003. This species was found at four additional locations in 2014.
Stinkbells *Fritillaria agrestis*	4.2	The scrub and woodland communities and the grasslands provide potentially suitable habitat for this species. It has been observed in the southwestern portion of the planning area within the blue oak woodland vegetation community. This species was not found during plant surveys conducted in 2003 (Ecosystems West 2004); however, an undescribed fritillary species was found. AECOM and TRA Environmental Sciences observed fritillary plants in areas where Ecosystems West had observed the undescribed fritillary; however, all of the fritillary plants present had aborted their flower buds and could not be positively identified. This species was positively identified during surveys conducted in 2016 (MIG 2016).
Sylvan scorzonella *Microseris sylvatica*	4.2	The woodland and scrub communities and grasslands provide potentially suitable habitat for this species. It has been documented in the planning area (State Parks 2000) This species was not found during plant surveys conducted in 2003 (Ecosystems West 2004) but was found during plant surveys in 2016 (MIG 2016).
Jepson's woolly sunflower *Eriophyllum jepsonii*	4.3	The scrub and woodland communities provide potentially suitable habitat for this species, which has been observed in many locations throughout the planning area, the most recent recorded observations made during the 2016 surveys (MIG 2016).
Fritillary *Fritillaria* sp.	None	Fritillary plants that do not correspond to any known species in California were observed in two locations in 2003. These plants do not have a state or federal status, but they may be a variant of stinkbells or an undescribed species. AECOM and TRA Environmental Sciences observed fritillary plants in areas where Ecosystems West had observed the undescribed fritillary; however, all of the fritillary plants present had aborted their flower buds and could not be positively identified.

Notes:
* California Rare Plant Rank (CRPR) definitions:
1.B.1: Rare, threatened, or endangered in California and elsewhere, and seriously endangered in California
1.B.2: Rare, threatened, or endangered in California and elsewhere, and fairly endangered in California
1.B.3: Rare, threatened, or endangered in California and elsewhere, but not very endangered in California
4.2: Uncommon and fairly endangered in California
4.3: Uncommon but not very endangered in California

Table 2-10. Special-Status Plant Species Documented in and Near the Planning Area–Species Documented Within 5 Miles of the Planning Area

Species	California Rare Plant Rank*	Comments
Large-flowered fiddleneck *Amsinckia grandiflora*	1.B.1	This species is federally and state listed as endangered. The woodland communities and grassland provide potentially suitable habitat.
Big tarplant *Blepharizonia plumosa*	1.B.1	This species is also a focal species in the *East Alameda County Conservation Strategy*. The grasslands provide potentially suitable habitat for this species, which was identified at 12 locations, west of the planning area, during surveys conducted in 2003 (Ecosystems West 2004) and in 2016 (MIG 2016).
Round-leaved filaree *California macrophyllum*	1.B.1	The woodland communities and grasslands provide potentially suitable habitat for this species. It has been documented in two specific locations within the planning area (Ecosystems West 2004), and there is a record with vague location information in the vicinity of the planning area. The two specific locations where this plant was previously recorded were revisited during separate surveys by AECOM and TRA Environmental Sciences in 2014 and this species was not relocated.
Diamond-petaled California poppy *Eschscholzia rhombipetala*	1.B.1	Alkaline clay soils in the grasslands provide potentially suitable habitat for this species. This species was observed north of Tesla Road in the vicinity of the planning area (CNDDB 2022).
Loma Prieta hoita *Hoita strobilina*	1.B.1	The woodland communities in the planning area provide potentially suitable habitat for this species, which is usually found in serpentinite soils in mesic areas. Soils of the Franciscan complex in the southern portion of the planning area may contain minor serpentine inclusions. There is record of this species being within 5 miles of the planning area.
Showy golden madia *Madia radiata*	1.B.1	The woodland communities and grasslands provide potentially suitable habitat for this species.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	1.B.1	Two records exist of this species with vague location information indicating they may be within 5 miles of the planning area, but the species is believed to have been extirpated from Alameda and San Joaquin Counties.
Alkali milk-vetch *Astragalus tener* var. *tener*	1.B.2	Potentially suitable clay soils are present in the grasslands within the planning area.
San Joaquin spearscale *Atriplex joaquinana*	1.B.2	This species is also a focal species in the *East Alameda County Conservation Strategy*. Alkaline soils in the grasslands provide potentially suitable habitat for this species.
Big-scale balsamroot *Balsamorhiza macrolepis*	1.B.2	The scrub and woodland communities and grassland provide potentially suitable habitat for this species.
Lemmon's jewelflower *Caulanthus lemmonii*	1.B.2	The California juniper woodland and grasslands provide potentially suitable habitat for this species. A record exists of this species with vague information about a location in the vicinity of the planning area.
Mt. Hamilton fountain thistle *Cirsium fontinale* var. *campylon*	1.B.2	This species is found in serpentine seeps in chaparral, cismontane woodland, and annual grasslands. No serpentine seeps are present in the planning area.

Species	California Rare Plant Rank*	Comments
Talus fritillary *Fritillaria falcata*	1.B.2	This species is found in serpentinite soils, usually talus, in chaparral, cismontane woodland, and lower montane coniferous forest. Suitable serpentine habitat may be present, as serpentine indicator species have been found in the planning area and soils of the Franciscan complex in the southern portion of the planning area may contain minor serpentine inclusions.
Diablo helianthella *Helianthella castanea*	1.B.2	This species is found in rocky soils in a variety of upland habitat types, but most often in chaparral–oak woodland interface. Woodland and grassland communities provide potentially suitable habitat.
Brewer's western flax *Hesperolinon breweri*	1.B.2	This species is found in chaparral, cismontane woodland, and annual grasslands, usually on serpentine soils. This species was found near the planning area (Alameda-Tesla property) at one location in the planning area in 2014. This find represents a range extension for this species, which was previously known only from Napa, Solano, and Contra Costa Counties.
Shining navarretia *Navarretia nigelliformis* ssp. *radians*	1.B.2	The woodland communities and grasslands provide potentially suitable habitat for this species.
Sharsmith's onion *Allium sharsmithiae*	1.B.3	This species grows in serpentinite soils in chaparral and cismontane woodland. Suitable serpentine habitat may be present, as serpentine indicator species have been found in the planning area, and soils of the Franciscan complex in the southern portion of the planning area may contain minor serpentine inclusions.
Tehama County western flax *Hesperolinon tehamense*	1.B.3	This species grows in serpentinite soils in chaparral and cismontane woodland. Suitable serpentine habitat may be present, as serpentine indicator species have been found in the planning area and soils of the Franciscan complex in the southern portion of the planning area may contain minor serpentine inclusions.
Chaparral ragwort *Senecio aphanactis*	2.2	The scrub and woodland communities provide potentially suitable habitat for this species, which has been documented in two locations in the Alameda-Tesla property, adjacent to the planning area. Seven colonies of chaparral ragwort were found in these two locations in 2003 (Ecosystems West 2004). These locations were visited in 2014 by AECOM and TRA Environmental Sciences botanists and the species was not found. A reference population outside the planning area was visited and the species was not found. It is assumed that the species did not survive to bloom in 2014 because of poor climatic conditions. Before its regional discovery in 1998, the last record of this species in Northern California was a 1933 herbarium record from Nortonville Hills near Antioch (State Parks 2000). An additional occurrence was found in Alameda County in 2003 (Coyote Hills Regional Park).
Santa Clara thorn-mint *Acanthomintha lanceolata*	4.2	The scrub and woodland communities provide potentially suitable habitat for this species, which has been documented in three locations in the vicinity of the planning area during 2016 surveys (MIG 2016).
California androsace *Androsace elongata* ssp. *acuta*	4.2	The scrub and woodland communities and the grasslands provide potentially suitable habitat for this species, which has been documented in four locations in the vicinity of the planning area (MIG 2016).

Species	California Rare Plant Rank*	Comments
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	4.2	This species grows in chaparral and cismontane woodlands, generally in serpentinite soils. Suitable serpentine habitat may be present, as serpentine indicator species have been found in the planning area and soils of the Franciscan complex in the southern portion of the planning area may contain minor serpentine inclusions. This species has not been identified during any surveys or database searches within or near the planning area. Additionally, this species is generally restricted to Marin and Santa Clara Counties.
Phlox-leave serpentine bedstraw *Galium andrewsii* ssp. *gatense*	4.2	This species grows in chaparral and cismontane woodlands, generally in rocky and serpentinite soils. This species was observed in the vicinity of the planning area during the 2016 surveys (MIG 2016).
Michael's rein orchid *Piperia michaelii*	4.2	This species grows in chaparral and cismontane woodlands and was found growing along Corral Hollow Creek, in the vicinity of the planning area during the 2016 surveys (MIG 2016).
Santa Clara red ribbons *Clarkia concinna* ssp. *automixa*	4.3	The scrub and woodland communities provide potentially suitable habitat for this species. There is record of this species being within 5 miles of the planning area.

Notes:

* California Rare Plant Rank (CRPR) definitions:
  1.B.1: Rare, threatened, or endangered in California and elsewhere, and seriously endangered in California
  1.B.2: Rare, threatened, or endangered in California and elsewhere, and fairly endangered in California
  1.B.3: Rare, threatened, or endangered in California and elsewhere, but not very endangered in California
  4.2: Uncommon and fairly endangered in California
  4.3: Uncommon but not very endangered in California

Additional CRPR species have been documented in the 12-quadrangle search area but are not known to occur within 5 miles of the planning area. Although potentially suitable habitat is present for these species in the planning area, they are considered to have low potential to occur because they have not been found in the planning area during previous floristic surveys and known occurrences are located many miles away. These species are:

- Carlotta Hall's lace fern (*Aspidotis carlotta-halliae*)
- heartscale (*Atriplex cordulata* var. *cordulata*)
- brittlescale (*Atriplex depressa*)
- lesser saltscale (*Atriplex minuscula*)
- big-scale balsamroot (*Balsamorhiza macrolepis*)
- Mt. Diablo fairy-lantern (*Calochortus pulchellus*)
- Oakland star-tulip (*Calochortus umbellatus*)
- Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)
- dwarf soaproot (Chlorogalum pomeridianum var. *minus*)
- hispid salty bird's-beak (*Chloropyron molle* ssp. *hispidum*)
- palmate-bracted bird's-beak (*Chloropyron palmatum*)
- Brewer's clarkia (*Clarkia breweri*)
- small-flowered morning-glory (*Convolvulus simulans*)
- Recurved larkspur (*Delphinium recurvatum*)
- bay buckwheat (*Eriogonum umbellatum* var. *bahiiforme*)
- San Joaquin spearscale (*Extriplex joaquinana*)
- Diablo helianthella (*Helianthella castanea*)
- serpentine leptosiphon (*Leptosiphon ambiguus*)
- large-flowered leptosiphon (*Leptosiphon grandiflorus*)
- Mt. Hamilton coreopsis (*Leptosyne hamiltonii*)
- spring lessingia (*Lessingia tenuis*)
- Mt. Diablo cottonweed (*Micropus amphibolus*)

Special-Status Wildlife

The determination of which special-status wildlife species have the potential to occur in the planning area is based on:

- vegetation communities present on the site,
- USFWS species lists for Alameda and San Joaquin Counties,
- observations of special-status wildlife species from park personnel and ongoing monitoring activities, and
- studies conducted in the planning area and on adjacent parcels of land with similar habitat types.

A complete list of sources used for this analysis was provided previously in the introduction to the "Biotic Resources" section.

Twenty-six special-status wildlife species have been observed or are assumed present in the planning area based on the habitats present in the planning area, the area's location relative to the species' known occurrence range, and previous surveys or assessments performed there (Table 2-11). Figure 2-16 shows the distribution of CNDDB records of special-status wildlife occurrences documented within 5 miles of the planning area. Figure 2-17 shows the detections of special-status bird, reptile, and amphibian species made during HMS surveys conducted by State Parks. (Not all observations of special-status species made in the planning area have been reported to the CNDDB and specific location information is not available for all observations. Therefore, not all special-status species reported in the planning area are reflected in the species occurrence figures.)

Table 2-11. Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area–Invertebrates

Species	Status*	Comments
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	This species may occur in portions of the planning area where elderberry (*Sambucus* sp.) shrubs are present. Elderberry shrubs have been documented within Corral Hollow Floodplain, Franciscan Loop West, and Kiln Canyon (State Parks 2005b; 2021). Potential valley elderberry longhorn beetle exit holes were observed within numerous elderberry shrubs along Franciscan Loop West and Kiln Canyon Road.

* Status:
FT = federally listed as threatened

Table 2-12. Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area–Reptiles and Amphibians

Species	Status*	Comments
Alameda whipsnake *Coluber lateralis euryxanthus*	FT, CT	This species is found in coastal scrub, chaparral, and grassland habitats. It is known to occur in western San Joaquin County, southern Alameda County, and northern Santa Clara County. The planning area is within designated critical habitat for the species. A whipsnake determined to be a hybrid of chaparral whipsnake and Alameda whipsnake was observed at Carnegie SVRA in 2007 (State Parks n.d.[c]). Whipsnake observations were made in 2013 and 2014, but the species could not be positively identified during either of these sightings. It is assumed that Alameda whipsnake could occur in the planning area.
California glossy snake *Arizona elegans occidentalis*	CSC	This species is found in chaparral, sage-scrub, and alluvial soils. This species was observed along Tesla Road, adjacent to the planning area (Vollmar 2023).

Species	Status*	Comments
California red-legged frog *Rana draytonii*	FT, CSC	The ponds and backwaters of drainages such as Corral Hollow Creek provide potential habitat for this species. California red-legged frogs typically require water bodies with at least 22 weeks of water for breeding. Therefore, not all water features in the planning area provide suitable habitat for the species. Surveys conducted in 2018 documented California red-legged frog within Lime Kiln Pond in the southern portion of the planning area (State Parks 2019a). The planning area is within designated critical habitat for this species.
California tiger salamander - central California DPS *Ambystoma californiense* pop. 1	FT, CT	California tiger salamanders in the planning area are considered part of the Central Valley distinct population segment. This species utilizes vernal pools and other seasonal wetlands for breeding and upland grasslands during the dry season. California tiger salamanders have been documented in Lower Juniper Pond within the planning area and several additional ponds just outside of the planning area (State Parks 2015a; 2019).
Coast horned lizard *Phrynosoma blainvillii*	CSC	This species is found throughout California west of the Sierra Nevada, with the exception of extreme northwest, in a variety of scrub and grassland habitats. California horned lizard has been incidentally observed in the planning area (State Parks 2015a).
Foothill yellow-legged frog – central coast DPS *Rana boylii* pop. 4	CE; petitioned for listing under ESA. USFWS has determined that listing may be warranted	Streams and creeks in the planning area provide potential habitat for this species. Surveys for foothill yellow-legged frogs have documented occurrences of frogs in Corral Hollow Creek in the vicinity of the planning area the in 2000 (State Parks 2000, n.d.[f]. Vollmar 2023). This species was not observed during 2018 surveys but is likely that they are still present within the planning area (State Parks 2019a).
San Joaquin whipsnake *Coluber flagellum ruddocki*	CSC	The species is found in scrubland, woodland, and grassland habitats throughout California, and this subspecies is found in California from the Sacramento Valley south to the Grapevine area. This species has been observed in the planning area (State Parks 2015a).
Silvery legless lizard *Anniella pulchra*	CSC	This subspecies is found from the central portion of California west to the coast. Its habitat is typically sandy soils in chaparral, pine-oak woodland, and riparian habitats. This species has not been documented to occur in the planning area. However, the planning area contains suitable habitat for this species.
Western pond turtle *Actinemys marmorata*	CSC petitioned for listing under ESA	Perennial ponds in and near the planning area provide potential habitat for this species. Western pond turtles have been documented to occur in Kiln Canyon Basin. This species was observed within the Tesla Stock Pond adjacent to the planning area but was not observed within the planning area. A record of this species is located north of Tesla Road near the planning area (Vollmar 2023).
Western spadefoot *Spea hammondii*	CSC; petitioned for listing under ESA. USFWS has determined that listing may be warranted	Seasonal pools in the planning area provide potential breeding habitat for this species and annual grassland habitats provide potential upland refugia in the planning area. This species was observed at Tyson's Pond during 2018 surveys. While there was no evidence of breeding at this location, Tyson's Pond is the only pond within the planning area that retains water long enough to support breeding (State Parks 2019a). There are multiple records of this species along Corral Hollow Creek floodplain within and adjacent to the planning area. The nearest CNDDB Occurrence number is #152.

Notes: ESA = federal Endangered Species Act; HMS = Habitat Monitoring System; USFWS = U.S. Fish and Wildlife Service

* Statuses:
CSC = California species of special concern (California Department of Fish and Wildlife [CDFW])
CT = state-listed as threatened
CE = state-listed as endangered
FE = federally listed as endangered
FT = federally listed as threatened

Table 2-13. Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area–Birds

Species	Status*	Comments
Burrowing owl *Athene cunicularia*	CSC (breeding sites and some wintering sites)	Annual grassland habitats in the planning area could potentially support burrowing owls. A burrowing owl was observed adjacent to the planning area during reconnaissance surveys within the Alameda-Tesla property. Burrowing owls have also been observed on the adjacent LLNL Site 300.
California horned lark *Eremophila alpestris actia*	CSC	This species occurs in annual grassland and open woodland habitats throughout the Central Valley. Horned larks are known to occur in the planning area (State Parks 2015a).
Ferruginous hawk *Buteo regalis*	W	Ferruginous hawks winter in California. In the planning area, this species has been observed foraging in grassland areas during HMS surveys in 2006 (State Parks n.d.[b]). This species was not observed within HMS surveys conducted in 2011 through 2014 (State Parks 2015a).
Golden eagle *Aquila chrysaetos*	BE, CFT (nesting and wintering)	This species forages in open grassland habitats and nests in large trees, snags, and transmission towers. The species is relatively common in the Alameda-Tesla property adjacent to the planning area, where it is known to nest (State Parks n.d.[f]) and is frequently detected during HMS annual monitoring surveys. Golden eagle pairs have been documented foraging and nesting in the vicinity of Carnegie SVRA for several years. In 2023, a nest pair was observed incubating in an alternative nest site near the planning area, about 0.3 miles south of their typical nest within the transmission tower (Hunt 2002; Hunt and Hunt 2006, 2013).
Grasshopper sparrow *Ammodramus savannarum*	CSC (nesting)	This species is generally associated with open grassland habitats containing patches of bare ground. It nests on the ground. Grasshopper sparrow was detected in the planning area during HMS surveys in 2012, and it could nest in the planning area.
Loggerhead shrike *Lanius ludovicianus*	CSC (nesting)	This species occurs in annual grassland and open woodland habitats. Loggerhead shrikes are regularly detected on HMS survey transects throughout the planning area.
Northern harrier *Circus cyaneus*	CSC (nesting)	Annual grassland habitats in the planning area are suitable foraging and nesting habitat for this species. This species is known to occur in the vicinity of the planning area (State Parks 2005a; State Parks 2015a).
Olive-sided flycatcher *Contopus cooperi*	CSC (nesting)	This species breeds primarily in late-successional coniferous forests and forages mostly in openings or at forest edges. Olive-sided flycatcher was observed in the planning area during HMS surveys in 2011, but the planning area does not contain the species' preferred breeding habitat, so it is not expected to nest in the planning area.
Swainson's hawk *Buteo swainsoni*	CT	This species requires large, open grasslands with suitable nest trees; nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, lightly grazed pastures/crops, irrigated pastures, and grain fields. This species has been documented nesting more than 7 miles northeast of planning area (CNDDB 2022). Riparian areas where large trees exist in the planning area could provide habitat.
Tricolored blackbird *Agelaius tricolor*	CT	This species is found in freshwater marsh and other emergent wetland habitats. It forages in open grasslands and agricultural areas. Suitable nesting habitat for this species occurs along Corral Hollow Creek, and this species has been observed within the planning area, but specific location information was not recorded.
White-tailed kite *Elanus leucurus*	CSC, CFT (nesting)	This species forages in open grassland habitats and nests on the edges of riparian habitats and open woodlands. This species has been documented in the planning area during HMS surveys in 2011.

Species	Status*	Comments
Yellow warbler *Setophaga petechia*	CSC	This species occurs in riparian habitat close to water in streams or wet meadows. Yellow warbler was observed during HMS surveys in 2010, 2011, 2013, and 2014, and it could nest in riparian habitat in the planning area.

Notes: HMS = Habitat Monitoring System

* Statuses:

BE = protected by Bald Eagle and Golden Eagle Protection Act

CFT = California fully protected species

CSC = California species of special concern (California Department of Fish and Wildlife [CDFW])

CT = state-listed as threatened

W = CDFW watch list

Some of the stock ponds in the planning area support special-status species, namely western pond turtle, western spadefoot, California red-legged frog, and California tiger salamander. These species have persisted at Carnegie SVRA despite ongoing OHV activity. However, because of their status, specific management actions may be required in some areas of the planning area known to support special-status species.

Elderberry shrubs are present at the SVRA. Elderberry shrubs with branches greater than 1 inch in diameter are considered potential habitat for the valley elderberry longhorn beetle, an invertebrate that is federally listed as threatened. Surveys conducted in 2021 found potential valley elderberry longhorn beetle exit holes in elderberry shrubs in Franciscan Loop West and along Kiln Canyon Road.

HMS surveys identified various mammals including Yuma myotis, fringed myotis, and hoary bat within the Alameda-Tesla property adjacent to the planning area. While these species could be found within the planning area, they are not considered in Table 2-14 as they do not meet the requirements of “special status species” as defined in the introduction of Section 2.3.2.3.

Table 2-14. Special-Status Wildlife Species Observed or Assumed to Be Present in the Vicinity of Planning Area–Mammals

Species	Status*	Comments
American badger *Taxidea taxa*	CSC	This species is found in a variety of grassland and shrubland habitats. This species has been observed in the planning area during ongoing monitoring by State Parks as part of the HMS (State Parks n.d.[c]).
Pallid bat *Antrozous pallidus*	CSC	This species occurs throughout California in a variety of desert scrub, grassland, and coniferous forest habitats. Suitable roosting habitat exists in the Tesla Coal Mine and Lime Kiln Cave in the vicinity of the planning area and possibly in rock outcroppings throughout the planning area. This species was detected at Tyson’s Pond and Lime Kiln Cave during summer 2014 and acoustic surveys conducted in 2016 (de Silva, pers. comm. 2014; MIG 2016).
San Joaquin kit fox *Vulpes macrotis mutica*	FE, CT	This species’ range extends from the southern San Joaquin Valley near Bakersfield north to Alameda County. In the planning area, it could potentially occur within grassland habitats. San Joaquin kit foxes have been documented in the planning area in 2002 (CNDDB 2022) and USFWS expects that this species is present at least periodically (USFWS 2022).
San Joaquin pocket mouse *Perognathus inornatus*	BLM	This species occurs in open grassland in the Central Valley and extending into the Salinas Valley. The San Joaquin pocket mouse has been documented in the planning area during small mammal trapping as part of the HMS and studies conducted by State Parks in 2020 (State Parks n.d.[c]; 2020).

Species	Status*	Comments
Townsend's big-eared bat *Corynorhinus townsendii*	CSC	This species occurs in a variety of habitats in California including desert scrub, riparian areas, grasslands, and coniferous forests. Bat-specific acoustic surveys conducted in 2016 did not detect this species anywhere within the planning area. Historically and recently, the Tesla Mine near the planning area provided roosting habitat for Townsend's big eared bat. It is assumed that the species can forage in the planning area at least periodically, given its distribution in California. Suitable roosting habitat exists in the Tesla Coal Mine near the planning area and Lime Kiln Cave within the planning area and possibly in rock outcroppings in the planning area. The 2008 and 2014 HMS reports mentions the species as occurring in the planning area (State Parks n.d.[d]; State Parks 2015a). This species was identified in the Tesla Coal Mine by State Parks staff members in September 2014 (de Silva, pers. comm., 2014).
Western mastiff bat *Eumops perotis californicus*	CSC	This species occurs in a variety of habitats including ponderosa pine forests, desert scrub, and oak woodlands. It roosts in rock outcrops. This species was detected at Tyson's Pond during acoustic surveys conducted in 2016. Rock outcroppings in the planning area may provide suitable roost habitat.

Notes: CESA = HMS = Habitat Monitoring System

* Statuses:

CSC = California species of special concern (California Department of Fish and Wildlife [CDFW])

CT = state-listed as threatened

FE = federally listed as endangered

FT = federally listed as threatened

California Tiger Salamander

California tiger salamander larvae were found in Tyson's Basin Pond in the planning area during the 2018 dipnet surveys. This species has also been detected in North Parcel, Mitchell Ravine, and Mobile Home Ponds (State Parks n.d.[f]) immediately to the west of the planning area. Several California tiger salamander larvae were also found in Lower Juniper Pond during HMS surveys conducted in 2011 and in Tyson's Pond during 2018 surveys (State Parks 2015a; State Parks 2019a).

California tiger salamanders have been found in ponds in the planning area during regular habitat monitoring activities.

California Red-legged Frog

California red-legged frogs are known to occur in Lime Kiln Pond within the planning area. Additionally, surveys conducted at the Carnegie SVRA in 2003 resulted in several observations of California red-legged frog. HMS surveys conducted by State Parks over the years resulted in observations of California red-legged frog in Corral Hollow Creek.

Alameda Whipsnake

Surveys conducted in the planning area by Karen Swaim in 1998 (Swaim 2000) resulted in no observations of Alameda whipsnake; however, Swaim recorded observations of chaparral whipsnake and

an intergrade between chaparral and Alameda whipsnake (State Parks 2000, n.d.[c]). Individual observations of whipsnakes were made in 2013 and 2014; however, the snakes could not be positively identified to species level. State Parks has considered the species to potentially occur in the planning area, given that suitable habitat exists in the Carnegie SVRA. The planning area also is within designated critical habitat for the species. Therefore, Alameda whipsnake could potentially inhabit the planning area.

San Joaquin Kit Fox

No focused surveys for San Joaquin kit fox have been conducted at Carnegie SVRA since the 1990s. In its consultation with State Parks in 2002, USFWS indicated that the presence of kit fox in the planning area should be assumed. An incidental observation of a kit fox pair was recorded in the SVRA in 2002 (CNDDB 2022, see Figure 2-16). USFWS also noted that it considers San Joaquin kit fox to potentially occur within the Carnegie SVRA (USFWS 2022).

Valley Elderberry Longhorn Beetle

Previously documented elderberry shrubs in the Corral Hollow Floodplain, Franciscan Loop West, and along Kiln Canyon Road were surveyed for the any evidence of Valley Elderberry Longhorn Beetle (State Parks 2021a). Elderberry shrubs with branches greater than 1 inch in diameter are considered potential habitat for the valley elderberry longhorn beetle. Potential valley elderberry longhorn beetle holes were identified within select elderberry shrubs within Franciscan Loop West and along Kiln Canyon Road. Additional elderberry shrubs that would provide potentially suitable habitat for this species may occur in suitable riparian and upland habitats in the planning area.

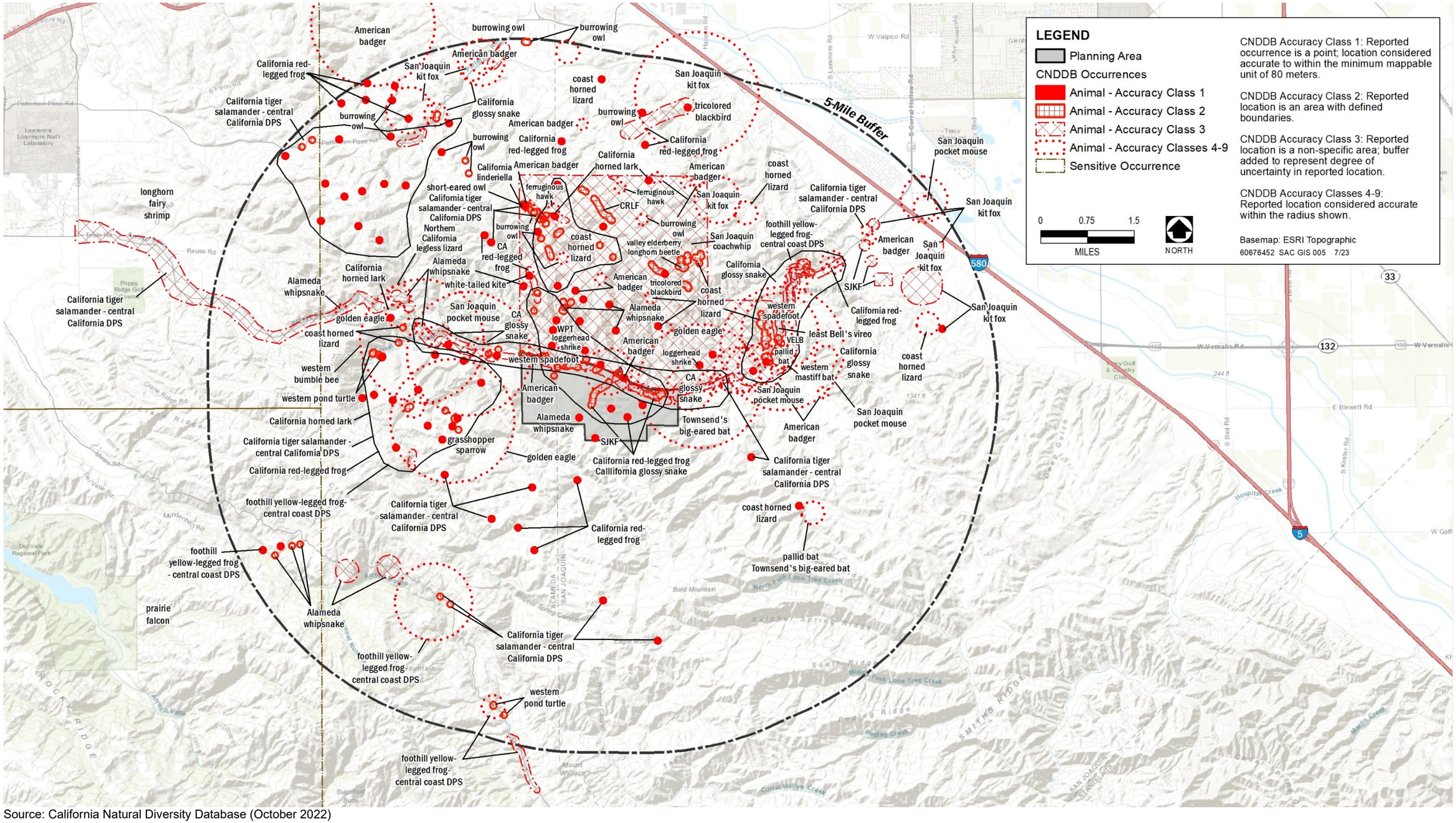
2.3.2.4 Exotic Plants and Wildlife

Exotic plant and wildlife species are those that have been introduced through human activities, either incidentally or deliberately. Most exotic or nonnative species are not invasive and do not adversely affect natural plant and animal communities. Nevertheless, the presence of some exotic plant species has resulted in the conversion of native habitats to a nonnative vegetation type. Introduced wildlife (such as feral cats and dogs) can compete with and negatively affect native wildlife. Bullfrogs (*Rana catesbeiana*) have been observed in stock ponds and wetlands in the planning area and are considered a nonnative predator of California tiger salamander and California red-legged frog. Wild boar (*Sus scrofa*) is commonly observed throughout the planning area.

2.3.2.5 Sensitive Habitats

Sensitive habitats are those that are of special concern to resource agencies or that are afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, Section 404 of the CWA, and the state's Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act), as discussed in Section 2.7.3, "Regulatory Influences." Sensitive natural habitat may be of special concern to these agencies and conservation organizations for a variety of reasons, including their locally or regionally declining status, or because they provide important habitat to common and special-status species.

The vegetation mapping conducted in support of the planning effort (AECOM 2012), the CNDDB (2022), wetland delineation for the planning area (TRA 2010a; State Parks 2016), and State Parks staff members are the primary sources of information about the location and extent of sensitive habitats in the planning area.



Source: California Natural Diversity Database (October 2022)

Figure 2-16. Special-Status Animal Species Occurrences within a 5-Mile Search Radius

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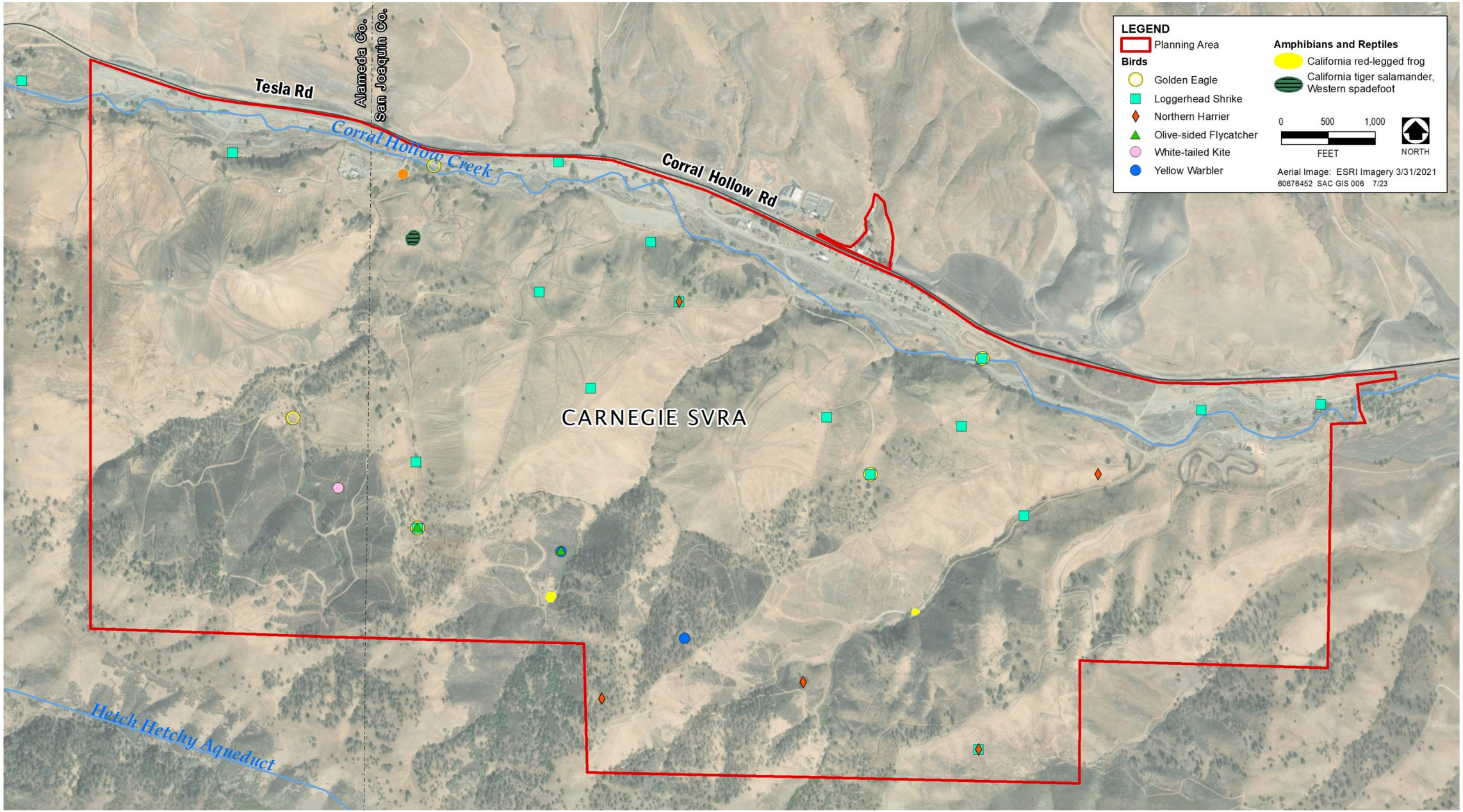

Source: State Parks 2014, adapted by AECOM 2009

Figure 2-17. Special-Status Bird, Amphibian, and Reptile Occurrences Recorded during HMS Surveys

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Special-Status Natural Communities

CDFW maintains a list of plant communities that are native to California. On that list, CDFW identifies special-status natural communities, which are defined as communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects (CDFW 2013:ix). These communities may or may not contain special-status species or their habitat. Occurrences of special-status natural communities are included in the CNDDB; however, no new occurrences of natural communities have been added to the CNDDB since the mid-1990s, when funding for natural-communities tracking was cut.

Vegetation types in the planning area that are included on the CDFW list of special-status natural communities consist of desert olive patches and Fremont cottonwood forest.

Waters of the United States

The 2016 wetland delineation verified by USACE identified a total of 25.90 acres of waters of the United States in the planning area consisting of Corral Hollow Creek, stock ponds, and other seasonal riverine features. The majority of this acreage (approximately 20.73 acres) is contained within the channels of Corral Hollow Creek. There are 6 ponds/basins in the planning area comprising approximately 1 acre. The only wetlands in the planning area not contained within the ordinary high-water mark of a pond or creek are the seeps (0.61 acre). The remaining acreage of waters of the United States is contained within seasonal drainage features.

These features are waters of the United States subject to USACE jurisdiction under Section 404 of the federal CWA and therefore qualify as sensitive habitats. Before any fill material may be placed into waters of the United States, USACE must issue a CWA Section 404 permit.

Other Sensitive Habitats

In addition to habitats that have been officially listed by CDFW as special-status natural communities or that meet the definition of waters of the United States, mule fat scrub is considered a sensitive habitat. Mule fat scrub is a sensitive habitat because it is a riparian habitat subject to regulation under Section 1602 of the California Fish and Game Code, like other riparian habitats in the planning area (Fremont cottonwood forest and desert olive patches) that are included on CDFW's list of special-status natural communities. Some of the acreage of these riparian habitats occurs within the ordinary high-water mark of waters of the United States including Corral Hollow Creek; however, some acreage of riparian habitats is located above the ordinary high-water mark and is therefore regulated only under the California Fish and Game Code. Not all of the desert olive patches are located in riparian settings; therefore, they would not all be subject to regulation under Section 1602. They would still be considered special-status natural communities as designated by CDFW.

2.3.3 Cultural Resources

Identified cultural resources within Carnegie SVRA are reflective of pre-contact Native American habitation of the area and remnants of railroading, mining activities, brick making, lime production and other historic-era activities. The Carnegie SVRA was subjected to a cultural resources inventory and evaluation from 2008 through 2010 which included survey of the adjacent Tesla expansion property which is outside of the planning area (ASC 2010). As a result of the previous inventory and recordation, 18 cultural resources were identified within the boundary of the Carnegie SVRA planning area. Of these resources, one reflects prehistoric land use and 17 are the results of historic-era themes relating to mining activities. State Parks determined the larger Tesla Mining and Industry Historic District is eligible for listing in the National Register of Historic Places (NRHP) at the state level under Criteria A, B, C, and D, with a period of significance between 1855 and 1911. In a letter dated December 7, 2012, the California Office of Historic Preservation (OHP 2012) concurred with State Parks' determinations and its proposed list of contributors and noncontributors to the significance of the Tesla Mining and Industry Historic District. There are nine contributing resources in the Carnegie SVRA planning area that are contributors to the historic district.

The prehistoric site identified in the planning area has been fenced off, capped, and revegetated.

The remains of the Carnegie Brick and Pottery Works (CA-SJO-311H) are within the planning area and are listed as California Historical Landmark (CHL) No. 740.

2.3.3.1 Precontact Land Use Patterns

The following overview of prehistoric land use is based on the work of Jeffrey Rosenthal, Gregory White, and Mark Sutton (Jones and Klar 2007:147) for the Sacramento and San Joaquin Valley area, and that of Randall Milliken et al. (2007) for the San Francisco Bay region, including Alameda County (Jones and Klar 2007:104).

Land use in this region falls into several broad regional patterns:

- Paleo-Indian Period
- Early Holocene (Lower Archaic)
- Early Period (Middle Archaic)
- Middle Period (Upper Archaic)
- Late Period (Emergent Period)

The earliest well-documented entry and spread of humans into California occurred at the beginning of the Paleo-Indian Period (13,500–10,500 calibrated radiocarbon years Before Present [cal B.P.]). (Archaeologists use the term “B.P.” instead of “B.C.” or “B.C.E.” [Before Common Era] when determining age. “Present” is defined as the year 1950, the year when this term was invented.) At that time glaciers had already receded from the crest of the Sierra Nevada, the present-day Sacramento and northern San Joaquin Valleys included extensive grasslands and riparian forest, and central California’s Sacramento–San Joaquin Delta estuary had not yet developed.

Archaeologists believe that social units during the Paleo-Indian Period were small, highly mobile, and not heavily dependent on exchange of resources, and that exchange activities occurred on an ad-hoc, individual basis. Distinctive fluted projectile points (which likely served as all-purpose tools) and flaked crescent-shaped implements are characteristic artifacts of this period. People frequently produced these and other stone tools from lithic materials that are archaeologically exotic to the areas in which the tools are found, indicating that the tool makers may have traveled great distances.

No evidence of human occupation in the Bay Area during the Paleo-Indian Period has been identified. Evidence of occupation in the Central Valley is limited to a few isolated locations, such as Tracy Lake and the south end of the valley (Jones and Klar 2007:151). Basally thinned and fluted projectile points represent cultural sites from this period. These projectile points are similar to Clovis points found elsewhere, which archaeologists have dated to 11,500–9550 cal B.P.

Generally drier conditions prevailed at the beginning of the Lower Archaic or Lower Holocene Period (10,500–7500 cal B.P.). As a result, areas of oak woodlands and grassland expanded at the expense of conifer forests. Milling stone technologies expanded, suggesting that people relied primarily on plant foods rather than meat, and settlement appears to have been semi-sedentary. Most stone tools were manufactured from local materials, and patterns of material exchange continued on an ad-hoc basis. Distinctive flaked-stone artifact types from this period include large projectile points with various shapes.

During the Middle Archaic Period (7500–2500 cal B.P.), foraging subsistence strategies gave way to more intensive food procurement practices. This period begins at the end of the mid-Holocene, when climatic conditions were similar to the present-day climate. The economic base became more diverse, and people began to use acorn-processing technology such as the mortar and pestle. Sedentism appears to have been more fully developed, and the population grew and expanded into more varied parts of the landscape. Little evidence exists that regularized exchange relations developed.

The growth of sociopolitical complexity and the development of status distinctions based on material wealth mark the Upper Archaic Period (2500–800 cal B.P.). Group-oriented religions emerged; the Kuksu

religious system may have originated at the end of this period. Exchange systems became more complex; archaeologists have seen evidence of regular, sustained exchanges between groups. Shell beads gained in significance as possible indicators of personal status and as important trade items. The large projectile points found in earlier periods were also present in this period, but in different styles. In addition, the bowl mortar and pestle replaced the milling stone and hand-stone throughout most regions of California.

Several technological and social changes characterized the Emergent or Late Prehistoric Period (800 cal B.P. to contact). Two subphases, Phase 1 and Phase 2, are typically recognized within the Emergent Period. The bow and arrow, which had been introduced at the end of the Upper Archaic Period, ultimately replaced the dart and atlatl used in earlier periods. Territorial boundaries between groups became well established. Distinctions in an individual's social status increasingly could be linked to acquired wealth. Groups exchanged goods more regularly and more goods, including raw materials, entered the exchange networks. The clamshell disk bead became a monetary unit for exchange and increasing quantities of goods moved greater distances. Specialists arose to govern various aspects of production and exchange.

2.3.3.2 Ethnography

Carnegie SVRA is located in the Diablo Range, which is generally considered the approximate boundary between the Native American people of the Northern Valley Yokuts and the Ohlone (Levy 1978:485; Wallace 1978:462).

Northern Valley Yokuts

The territory of the Northern Valley Yokuts extended north from the large bend in the San Joaquin River near Mendota to just south of the Mokelumne River and from the eastern slopes of the Diablo Range to the Sierra Nevada foothills (Wallace 1978:462), near the confluence of the San Joaquin and Calaveras rivers.

The Northern Valley Yokuts established year-round tribelet centers in the western subarea of their territory. The range of resources was limited, however, so these centers depended on exchange relationships with larger villages located along the San Joaquin River.

The acorn was an important staple to the Northern Valley Yokuts, who processed it in both stone and wood mortars. They also processed buckeye nuts for consumption. The Yokuts hunted deer, antelope, rabbits, and gophers year-round; ducks and other waterfowl, fish, and various insects, such as grasshoppers and caterpillars, were available seasonally (Kroeber 1925:524).

Evidence of Native American occupation, in the form of milling features, has been documented in and near the planning area. In his treatise, Earle Williams indicates that a Native American village was located on the site of the Edward B. Carrell house, which is immediately west of the planning area (Williams 1960).

Ohlone

The territory of the Ohlone extended from San Francisco Bay east to the Livermore Valley, and south to Point Sur and the upper Salinas River. At the time of European contact with the Ohlone (about 400 years ago), there were approximately 50 separate and politically autonomous nations or tribelets comprising eight ethnic groups and tribelets. Each ethnic group or tribelet spoke a distinct dialect of the Costanoan language, which was part of the larger Penutian language family. Speakers of the Chochenyo language comprised about 10 tribelets, with a total population of 2,000 individuals that occupied the area between the east shore of San Francisco Bay and Mission San Jose. This group most likely extended into the Livermore Valley—an area also within the tribal territory of the Northern Valley Yokuts—and located directly west of Carnegie SVRA (Levy 1978:485; Wallace 1978:462).

Costanoan-speaking peoples had an abundant range of natural resources, such as acorns, buckeye, hazelnuts, and laurel nuts. They parched (roasted) seeds from dock, tarweed, chia, and foothill pine in basketry trays and either ate the seeds or ground them into meal. Blackberries, elderberries, strawberries,

manzanita and madrone berries, and wild grapes were also part of their diet. Edible roots included wild onion, cattail roots, and wild carrots.

The Ohlone most commonly built domed thatched structures with rectangular doorways and central firepits. Their semi-subterranean sweathouses, which held up to eight individuals, were built adjacent to streambanks. In the center of a village the Ohlone constructed circular or rectangular structures that hosted dances and domed assembly houses that could hold up to 200 individuals.

The Ohlone traded primarily with their eastern neighbors—the Plains Miwok, Northern Yokuts, and Sierra Miwok. They appear to have had little contact with the Patwin and Miwok, who were located north of the bay and in the Sacramento–San Joaquin Delta.

Like other central California groups, the Ohlone were displaced from their land following the arrival of the Spanish. Most of the groups were sent to Mission San Jose between 1802 and 1805, with the largest group baptized in 1805. Together, missionization, disease, and displacement severely affected the traditional lifeways of the Costanoan-speaking people.

2.3.3.3 Historic Era

As in most of early California, historic-era land use in Corral Hollow Canyon was determined by natural resources and the exploitation of those resources. Land use patterns in Corral Hollow Canyon were driven by mining. Most of the historical overview presented in the cultural resources inventory report for Carnegie SVRA (ASC 2010), excerpted below, is based on the work of Dan Mosier and Earle Williams in *History of Tesla: A California Coal Mining Town* (Mosier and Williams 2002).

Spanish Period (Before 1800) and Early Settlement (Circa 1850–1860s)

The route through Corral Hollow Canyon was used by explorer Juan Bautista de Anza in 1776. This route is depicted as *Portezuela de Buenos Ayres* (Pass of Good Winds) on the 1834 drawing of Las Positas, and as *Arroyo Buenos Ayres* on Gibbes's map of the southern mines (1852) (Hoover et al. 1990:358).

Historical accounts by Earle Williams (1960) indicate that the Zink House, located east of the planning area at the mouth of Corral Hollow Canyon, was built around 1850 along El Camino Viejo, the oldest north-south route through the Central Valley. California State Historical Marker 755 was placed 500 yards southwest of the location of the Zink House at the site of the Edward B. Carrell House (White House), along the west side of Corral Hollow Road, adjacent to but not within the planning area. In 1970 the marker was stolen. Documentation indicates that the marker was to be replaced, but its current status is unknown. The inscription on the marker read as follows:

> The Edward B. Carrell home was built here at the site of an Indian village on El Camino Viejo, an old Spanish trail. Through here passed the 49'ers and the first mail to the Tuolumne Mines. Men and animals received food and drink at Wright's Zink house 500 yards north of here.

Earle Williams of Tracy, who wrote the original application, indicated that the text instead should have read "500 yards northeast of here" (Arbuckle 1979). Williams (1960) indicates that the Zink House was located where the present domestic buildings of a sheep ranch now stand.

Early Years of Corral Hollow and Ranching

The first Americans to arrive in the study area are likely to have been a group separated from the Donner-Reed party after leaving Fort Bridger, Wyoming. Captain Charles Imus, John and William Laird, John Pyle, and their wives and children may have stopped at the mouth of Corral Hollow in October of 1846. The following year, Imus built a horse corral near the mouth of the canyon at a narrow at Black Butte, and it is from this corral that the drainage gets its name (Mosier and Williams 2002:2). Imus's plan of corralling wild mustangs in the Central Valley for later sale ended when he learned that he had built his operation on grant lands held by Antonio Maria Pico. With the onset of the Gold Rush in 1848, Corral Hollow became a major thoroughfare to the goldfields, used by parties traveling from the Bay Area. In 1850, Horatio Wright and William Breyton abandoned the gold fields, settling west of the Imus tent camp in the ravine and

building a small tavern, the “Zink House”, named after the building’s zinc-coated iron sheet roofing. That same year, the Zink House was robbed and Breyton murdered. The tavern continued to operate, however, and other small tent businesses sprang up in the drainage to serve the miners (Busby 1981:27).

The first ranching endeavors began in 1846 when Charles Imus and his family used the area for corralling wild mustangs. In the 1890s various sheep herders controlled parcels within and surrounding present-day Carnegie SVRA, when ranching transitioned from sheep to cattle. Ranching continues as an economic pursuit on privately owned lands surrounding the planning area (Mosier and Williams 2002:172).

Mining (Circa 1856 to Mid–20th Century)

Early Coal Mining Operations

While surveying for the San Francisco and Stockton Railroad, Francis P. O’Byrne noted a foot-thick coal seam. Needing money for the railroad, he quickly sold the deposit to Frederick Marriott and Alfred Wheeler, who formed the California Coast Range Coal Mining Company in 1856. However, both the railroad and mining operations were short-lived. Next, Captain O’Brien and two friends with mining experience, Edward Carrel and Horatio Wright, discovered the Eureka and Livermore coal seams, which attracted two San Francisco investors, Joseph Kohn and Harmon Kozminski. This operation operated under the name of the Pacific Coal Mining Company and was somewhat successful, but in 1862 winter floods destroyed the wagon road, thus ending the operations.

Subsequently, Peter Donahue and his brother James purchased the Pacific Coal claim and reorganized the company through the new Eureka Coal Mining Company. However, the cost of transporting the coal to Donahue’s Union Iron Works in San Francisco was substantial, and the operations were abandoned in less than a year. Shortly thereafter, O’Brien and other owners of Pacific Coal reopened and operated the mine until 1866, when lower priced foreign coal flooded the market.

Late 19th– and 20th-Century Coal, Clay, and Glass Operations

The mine sat idle for 24 years. In 1890, the mine was purchased by John Treadwell, who purchased the Eureka Company and the adjacent Cardiff Company claim from William Coleman. Treadwell hired F. T. Newberry and State Geologist Watson Goodyear to design a 3,000-foot-long tunnel to access the coal deposits of the Eureka, Livermore, and Summit seams, which stretched across 6 miles of Corral Hollow. Subsequently, brothers John and James Treadwell developed an extensive network of businesses: clay, coal, sand, and manganese mines; industrial brick, pottery, and coal operations; lime kilns; gravel quarries; townsites; and transportation networks that included the Alameda and San Joaquin Railroad Company, which transported coal and quartz sand 36 miles to Stockton.

During its second year of operations, the San Francisco and San Joaquin Coal Mining Company was the largest producer in the state. It appears that the two largest components of the Treadwells’ entrepreneurial operations were the Carnegie Brick and Pottery Works and the Pacific Window Glass Company, described below.

Carnegie Brick and Pottery Works

First organized by the Treadwells in 1901 as the Stockton Brick and Pottery Company, this organization was moved from Stockton to Corral Hollow after a fire. It subsequently expanded under the name of the Carnegie Brick and Pottery Company. The expansion included not only kilns, a grinding and pug mill plant, a brick-cutting plant, and drying sheds, but housing, a school, and saloon for the 350 inhabitants (Mosier and Williams 2002:226, 223).

Workers at the Carnegie Brick and Pottery Company, Photo Courtesy of Dan Mosier.

The Treadwells named Carnegie after the industrialist and philanthropist Andrew Carnegie. The main residential portion of the townsite was located outside of the present-day planning area, on property now owned by LLNL to the north; however, the Graner Hotel, bakery, Carnegie Brick and Pottery Works, and the Pottery Works were all located in the planning area. The Carnegie Water Development Site, also within the planning area, contains three wells, the first that was dug circa 1895, and a reservoir that supplied water to the Carnegie Brick and Pottery Company and surrounding residences. The Carnegie Lime Kilns, sited south of the Carnegie townsite, were built in 1901 to process lime for cement. A year later the kilns were replaced with oil-burning kilns in Carnegie itself, but the lime operation only lasted until 1904. In 1905, the operations at the Carnegie Brick and Pottery Works were expanded further to include an architectural terra-cotta plant, which was dramatically expanded after the 1906 San Francisco earthquake to include a brick machine. By 1910, Carnegie products were being sold throughout California (Mosier and Williams 2002:234–240).

A 2021 replacement plaque for California Historical Marker No. 740 placed in 2021 for the commemoration of the 50th anniversary of the Off-Highway Motor Vehicle Recreation Program located at the entrance to Carnegie SVRA, states:

> In a town named for industrialist Andrew Carnegie, John and James Treadwell owned and operated the Carnegie Brick and Pottery Company from 1902 to 1912. Using clay mined at Tesla, four miles to the west of Carnegie, the factory produced over seventy million bricks and architectural terra cotta products, used in prominent buildings throughout California and the West, many of which stand today. The factory included numerous large buildings, twenty-six kilns, and four tall smokestacks. At its height, 350 people lived in Carnegie where one could find a company store, hotel, saloon, butcher shop, school, two bunkhouses, and family cabins. Two boiler explosions and financial difficulties beginning in 1909 led to the factory closing in 1912.

The Treadwell operations collapsed after a series of floods and fires, an explosion, and a financial catastrophe all occurred between 1902 and 1911. The towns were abandoned, fires and floods destroyed many of the buildings, and others were moved to nearby properties or scavenged for building materials. Gladding, McBean and Company purchased what was left of the brick and pottery works in 1916. The company systematically dismantled the entire operation, assuring that the Carnegie operation would be completely removed as a future competitor.

Although short-lived, the Carnegie Brick and Pottery Company produced a substantial amount of brick and pottery architectural elements used in buildings throughout California (ASC 2010:A-47).

Various features associated with mining operations within the planning area include historic-era dirt roads, collapsed coal mine shafts, and limestone prospect pits/coyote holes.

Pacific Window Glass Company

Although miners exploiting the Eureka coal seam had discovered a bed of window glass–quality white quartz sand in 1890, it was not until 1902 that the Treadwells began exploiting this resource. Their Pacific Window Glass Company in Stockton was the first windowpane–glass factory "west of the Mississippi" and was fed by mines producing more than 12,000 tons of quartz sands per year (Mosier and Williams 2002:250–251).

Ranching (Late 1800s to Present)

The first ranching endeavors began in 1846 when Charles Imus and his family used the area for corralling wild mustangs. Shortly thereafter, the O'Briens established a sheep ranch at the location of what would later be the Tesla townsite. After the O'Briens, much of the land was owned by Mary Crocker and Kate Dillon, the nieces of Charles McLaughlin, who was awarded the land by the federal government as payment for his work on the Central Pacific Railroad (Mosier and Williams 2002:9).

In the 1890s various sheep herders controlled parcels within and surrounding present-day Carnegie SVRA, when ranching transitioned from sheep to cattle. After the Treadwells' operations collapsed, the Tesla townsite was acquired by one such individual by the name of Flynn, who established the Tesla Cattle Company (Mosier and Williams 2002:172). Ranching continues as an economic pursuit on privately owned lands surrounding the planning area.

OHV Recreation

The area first started to be used informally by OHV motorcyclists in the 1940s. With the rise in popularity of OHV recreation into the 1950s and 1960s, problems arose from OHV enthusiasts riding in unauthorized areas which created the potential for erosion, effects on wildlife and habitat, and noise, water, and air quality concerns. In 1970 John Brillisour, Lee Peterson, and others purchased the Carnegie property and established the Carnegie Cycle Park as a private endeavor.

The California OHV program was created in 1971 when then-governor Ronald Reagan signed the Chappie-Z'berg Off-Highway Motor Vehicle Act into law, which eventually created the OHMVR Division within California State Parks in 1982. The legislation was co-authored by two state legislators – Gene Chappie, an off-road enthusiast, and Ed Z'berg, an environmental supporter, in order to address widespread public interest and concern about OHV recreation to balance the demand for OHV recreation with the need to protect resources. The law created a grants program to support local and federal agencies with OHV programs on public lands, established a dedicated funding source, provided for the development and expansion of areas for managed and sustainable OHV recreation. In 1979, the State of California purchased the 1,533-acre Carnegie property using OHV Trust Funds and the SVRA was added to the State Park system in 1980 and it continues to be used as an OHV recreation center today (ASC 2010:31). In 2018, new regulations for the program included additional protocols for natural and cultural resources management and other legislative changes to continue the primary goal to provide well-managed, environmentally responsible, and sustainable OHV use in California (State Parks 2019b).

Today, Carnegie is one of nine SVRAs located in northern and southern California spanning 145,000 acres. The OHMVR Division works to ensure quality recreational opportunities remain available for future generations by providing for education, conservation, and enforcement of efforts that balance OHV recreation impacts with programs that conserve and protect cultural and natural resources (California State Parks Off-Highway Motor Vehicle Recreation Division 2019).

Within the planning area are built environment resources that are of historic age and used as secondary supporting facilities for park operations such as staff residences, garages/carports, and water utility infrastructure. None of these park-supporting historic-age resources have been evaluated for historical significance.

2.3.3.4 Archaeological Resources

From 2008 to 2010, State Parks contracted with the Anthropological Studies Center (ASC) at Sonoma State University to identify historical resources within Carnegie SVRA and evaluate the resources'

historical significance and integrity according to the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHP) criteria. The cultural resource inventory of Carnegie SVRA included the survey, recordation, and evaluation of historic-era sites, features, and artifacts to learn more about the brick and pottery industrial undertakings and company town sites within Corral Hollow between 1855 and the 1960s. As described above, Carnegie SVRA is listed as a California Historical Landmark Number 740 for its industrial history and settlement:

> **NO. 740 CARNEGIE** - A city of 3,500 population from 1895-1912, the town had a post office, company store, hotels, saloons, bandstand, and hundreds of homes. The Carnegie Brick and Pottery Company had 45 kilns and 13 tall smokestacks, clay came from the famous Tesla Coal Mine, four miles to the west. Town and plant were served by the Alameda and San Joaquin Railroad. (Parks, C. S. (n.d.).

Carnegie SVRA regularly monitors its cultural sites for damage or impacts. Wildfires at the park create one of the biggest concerns with protecting cultural resources-- it has burned several times since 2017 and twice in 2020. Cultural resources risk exposure and damage from fires. Surveying and monitoring sites for fire damage have increased in recent years. Numerous historical artifacts such as bricks, pottery, terra cotta, and other construction materials surround the Carnegie Brick and Pottery Company and SVRA. Fortunately, the fires and fire suppression efforts did not damage any cultural resources in recent fires. The lack of vegetation due to fire has led to an increase in visitors collecting and moving artifacts.

Diablo Range District cultural resources staff conduct annual cultural sensitivity training that teaches park staff what to look for in the landscape, guidelines to address visitor collecting, and what to do if visitors turn in artifacts. Carnegie SVRA participates in the California Archaeological Site Stewardship Program (CASSP), where trained volunteers help monitor important sites that park staff cannot visit as often. In addition, Carnegie SVRA staff developed educational content for programs and public outreach about the park's historic landscape. For instance, interpreters created a video series on the Carnegie Brick and Pottery Company and the Tesla Mining Company. These videos are intended for young children and inform them about the park's history.

Native American Cultural Resources

ASC conducted archaeological surveys of Carnegie SVRA from 2008 to 2010 and prepared a cultural resources report. During the current general plan update, the Northern Yokut tribe recommended State Parks conduct an updated cultural resources survey. The updated survey was recommended for three reasons. First, a large portion of the SVRA was never surveyed. The 2008-2010 survey focused on specific areas, such as historic resources on the valley floor, but did not examine the entire property. Second, it is a best management practice to update large surveys every 5-10 years. Lastly, after consultation with the Native Californian American Tribal community, they recommended a new survey incorporating traditional tribal knowledge.

State Parks contracted with ASC in 2024 to:

- Incorporate traditional tribal knowledge into the survey and reporting process;
- Conduct a reconnaissance survey using 15-meter transects through the entire property;
- Record previously recorded sites using Geographic Information System (GIS) and current scientific standards and record cultural sites important to Tribal Partners;
- Evaluate sites for inclusion in the National Register of Historic Places.

ASC conducted field surveys on June 20-25, July 22-26, and September 3-4, 2024. State Parks Tribal Liaisons met with the Northern Valley Yokut/Ohlone Tribe at Carnegie SVRA on June 27 and September 9, 2024, to discuss the project scope, a survey strategy, and identification of Traditional Tribal Resources. State Parks and Northern Valley Yokut/Ohlone Tribe also communicated weekly on survey status and recordings. ASC worked with Diablo Range District's Associate State Archaeologist and Cultural Resources Supervisor, the Northern Yokut Chairperson and Tribal monitor throughout the archaeological survey.

2.3.4 Aesthetic Resources

2.3.4.1 Regional Context

Carnegie SVRA is located on both sides of the border between Alameda and San Joaquin counties in Corral Hollow Canyon. The surrounding area is characterized by steeply rolling hills. Undeveloped ridgelines and steep hillsides provide common background views near the planning area. The hillsides and ridges are generally characterized by grasslands, with scattered oak woodlands, while valley bottoms have denser or riparian vegetation. The floor of Corral Hollow Canyon is characterized by historical rural industrial uses, including LLNL Site 300 (adjacent to the planning area to the east) and former landfill and quarry uses near the mouth of the canyon and the intersection of Corral Hollow Road with I-580. Valley floors to the east (in the Central Valley) and the west (in the Livermore Valley) are generally characterized by a mix of agricultural and urban uses.

2.3.4.2 View from Public Roads

The primary public road in Corral Hollow Canyon is Corral Hollow Road/Tesla Road. San Joaquin County's general plan has identified Corral Hollow Road as a scenic route; scenic resources include rangelands, the Diablo Range foothills, and Corral Hollow Canyon. There are no designated overlooks or viewpoints in or near the planning area. Prominent built features along the roadway include fences; overhead power lines; grading and roadway features; residences; parking, camping, and event areas in the SVRA; an industrial facility (LLNL Site 300); and areas showing evidence of previous grading or excavation associated with historical mining and landfill activities. Corral Hollow Creek flows alongside the road for much of its route, and rocky and steep creek banks and vegetation are visible from the roadway. Viewpoint 1 (Figure 2-18) illustrates a typical view experienced by a driver on Corral Hollow Road, and Viewpoint 2 (Figure 2-18) shows Corral Hollow Road from the Carnegie SVRA. Viewpoint 3 (Figure 2-19) shows Corral Hollow Creek during the wet season; the creek bed is dry for much of the year.

Hillsides and background views are generally of grassland with scattered oak woodlands or rocky slopes. Motorcycle tracks are visible south of the road in the Carnegie SVRA. West of the SVRA, Corral Hollow Canyon has a more rural appearance, with fewer residences. Travelers along Corral Hollow Road/Tesla Road are commuters and local residents.

Viewpoint 1: View westward along Corral Hollow Road near the intersection with I-580.

Viewpoint 2: View northward across challenge and event areas on the Carnegie SVRA, with Corral Hollow Road and LLNL Site 300 beyond.

Figure 2-18. Representative Photographs

Viewpoint 3: View of Corral Hollow Creek facing east from the bridge at the Maintenance Yard. Note the power lines along Corral Hollow Road at left.

Viewpoint 4: View eastward from a hilltop west of the planning area, facing across the Central Valley with the Sierra Nevada in the background.

Figure 2-19. Representative Photographs

2.3.4.3 Views in the Planning Area

Visual Resources and Scenic Characteristics

The planning area consists of the Carnegie SVRA. Carnegie SVRA is generally open to the public, with the exception of certain areas that are closed for resource conservation purposes. Views in the planning area consist of trees and riparian vegetation along Corral Hollow Creek, grasslands, chaparral, and scattered oak trees on slopes and hilltops. The Carnegie SVRA includes developed areas along the creek, with large, open areas used for parking, camping, and special events. From hillsides and hilltops in the planning area, longer views extend up and down the canyon and into the Central Valley. The Sierra Nevada is visible from higher elevations on clear days. Viewpoint 4 (Figure 2-19) illustrates a long view with the Sierra Nevada in the background; and Viewpoints 5 and 6 (Figure 2-20) illustrate views of the canyon from the planning area.

Distinctive visual areas include hilltops throughout the planning area, but especially those facing Corral Hollow Canyon. These elevated viewpoints generally have long views across the Central Valley and the Sierra Nevada, as well as views of grassland, scattered oak trees, and chaparral in the foreground and middle ground.

Negative visual features and characteristics in the planning area include many of the developed camping, parking, and staging areas along Corral Hollow Creek. These areas are characterized by large expanses of gravel with few trees and little vegetation. Viewpoint 5 (Figure 2-20) illustrates graveled event areas in Carnegie SVRA in the middle ground. Hillsides in the Carnegie SVRA have visible motorcycle tracks in areas where OHV recreation is not confined to specific trails. Viewpoint 7 (Figure 2-21) illustrates hillsides with visible motorcycle tracks in the Carnegie SVRA.

External Views

The planning area is visible to travelers along Corral Hollow Road/Tesla Road in Corral Hollow Canyon, and to residents and users of nearby properties. Because of the surrounding topography, the planning area is not visible from the Central Valley.

Viewpoint 5: View northeast across the Carnegie SVRA with LLNL Site 300 facilities atop the hills in the background.

Figure 2-20. Representative Photographs

Viewpoint 6: View of the top of the grade on Tesla Road from an area west of the planning area.

Viewpoint 7: View of a typical north-facing slope on the site of the Carnegie SVRA.

Figure 2-21. Representative Photograph

2.3.5 Sound

2.3.5.1 Acoustic Fundamentals

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as sound that is unwanted (loud, unexpected, or annoying). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.

Noise Terminology

The following terms are used frequently in discussions of noise levels:

- *Decibels (dB)* measure sound pressure levels. Sound pressure amplitudes (positive or negative change in atmospheric pressure caused by a sound wave) that are measured for different kinds of noise environments using a term called a Pascal can range from less than 100 microPascals to 100,000,000 microPascals. Because of this huge range of values, sound is rarely expressed in terms of pressure. Instead, a logarithmic scale is used to describe sound pressure level in terms of dB. A-weighted decibels, abbreviated dBA, are commonly used to describe environmental sound pressure levels. There is a strong correlation between A-weighted sound levels and community response to noise. For this reason, the A-weighted sound level has become the standard descriptor for environmental noise assessment. All noise levels reported in this section are in terms of A-weighting.
- *Equivalent sound level (L_{eq})* represents an average of the sound energy occurring over a specified time period. In effect, the L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour, A-weighted equivalent sound level (i.e., the L_{eq}[h]) is the energy average of A-weighted sound levels occurring during a 1-hour period and is the basis for noise abatement criteria used by the California Department of Transportation and the Federal Highway Administration.
- *Day-night average sound level (L_{dn})* is the energy-average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours (10 p.m.–7 a.m.).
- *Community noise equivalent level (CNEL)* is the energy-average of the A-weighted sound levels occurring over a 24-hour period, with penalties of 5 dB and 10 dB, respectively, applied to A-weighted sound levels occurring during evening hours (7 p.m.–10 p.m.) and nighttime hours (10 p.m.–7 a.m.). The CNEL is usually within 1 dB of the L_{dn}, and for all intents and purposes, the two are interchangeable. Because it is easier to compute and more commonly used, the L_{dn} is the long-term noise measure used in this section.
- *Maximum sound level (L_{max})* is the highest instantaneous sound level measured during a specified period.

Human Response to Changes in Noise Levels

Because dB are measured on a logarithmic scale, doubling sound energy results in a 3-dB increase in sound. However, given a sound-level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually differ from what is measured.

Under controlled conditions in a laboratory setting, the trained, healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency range (1,000–8,000 Hertz). In typical noisy environments, changes in noise of 1–2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Furthermore, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of

loudness. Therefore, a doubling of sound energy that would result in a 3-dB increase in sound pressure level would generally be perceived as barely detectable.

2.3.5.2 Existing Sound Environment

Local traffic and OHV operations at the Carnegie SVRA are the dominant sources of noise in the area. Other noise sources, including detonations associated with explosives testing on nearby properties and gunshots associated with a nearby firing range, are relatively infrequent events that nevertheless produce high noise levels in the area. Ambient sound levels were measured at three locations (Figure 2-22) to quantify existing noise conditions during less busy weekday times and busier weekend times (with more OHV activity).

2.3.5.3 Existing Noise-Sensitive Land Uses

The planning area is generally surrounded by open space. Residences are the only noise-sensitive land uses; private housing is located to the north of the planning area within 1,000 feet of Tesla Road, approximately 1,000 feet west of the SVRA boundary. Ranchland exists in the areas surrounding the site. Parcel sizes in the area consist of large parcels of 110–280 acres and smaller parcels ranging in size from approximately 5 to 45 acres.

2.3.5.4 Ambient Noise Level Measurements

Local traffic and OHV operations in the Park are the dominant sources of noise in the project area. Ambient sound level measurements were conducted at four locations in the project area to quantify existing noise conditions. Please see Figure 2-22 in Chapter 2, "Existing Conditions," of the General Plan for the measurement locations. Continuous noise level measurements were recorded at two locations from approximately 12:00 p.m. on Wednesday, June 21, 2023, to 2:00 p.m. on Thursday, June 24, 2023. The ambient noise level measurement results are summarized in Table 2-15.

Table 2-15. Summary of Noise Measurements

Measurement Site	Noise Level Measurement Location	Daytime L_{eq} dBA	Daytime L_{max} dBA	Nighttime L_{eq} dBA	Nighttime L_{max} dBA	L_{dn} dBA
LT-01	Residential West of the Project Area Boundary	45	61	43	52	50
LT-02	Office Area, North of Moto Mart	57	73	56	66	62
ST-01	Maintenance Area south of West Valley Pump	51	63	NA	NA	NA
ST-02	18600 Corral Hollow Road	51	63	NA	NA	NA

Notes:
dBA = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = Equivalent Sound Level; L_{max} = Maximum Sound Level; LT = Long Term; ST = Short Term.
Source: Modeled by AECOM in 2023

All measurements were taken using Larson-Davis Laboratories (LDL) Model 820 and 831 precision integrating sound level meters. The meters were calibrated prior to the measurements using an LDL Model CA200 acoustical calibrator. The measurement equipment used meets the applicable criteria established by the American National Standards Institute (ANSI) for Class 1 sound level meters (ANSI S1.4). Measurement microphones were placed on tripods approximately 5 feet above the ground and were equipped with appropriate windscreens. The sound level meters were programmed to record hourly sound levels in terms of the L_{eq}, L_{max}, and other statistical descriptors.

Atmospheric conditions were observed during the long-term noise level measurement session. Wind speeds typically ranged from 3 to 16 miles per hour (mph). Temperatures ranged from 48-81°F, with humidity (approximately 21-87%). These atmospheric conditions were verified using historical data from www.localconditions.com. In general, the atmospheric conditions from June 21-22, 2023, were appropriate for environmental acoustics measurements.

2.3.5.5 Existing Traffic Noise

Traffic noise is the dominant noise source in the planning area and is generated by the main road (Corral Hollow Road/Tesla Road) adjacent to the planning area. Existing noise levels from vehicle traffic in the planning area vicinity, including regional roadways, were modeled using the Federal Highway Administration (FHWA 1978) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic count data provided by the traffic consultant for the Carnegie SVRA General Plan (KD Anderson & Associates 2012; Appendix D). The FHWA model is based on California Vehicle Noise (CALVENO) reference noise factors for automobiles, medium trucks, and heavy trucks, with vehicle volume, speed, roadway configuration, distance to the receptor, and ground attenuation factors considered.

Table 2-16 summarizes the modeled traffic noise levels, provides noise levels at 100 feet from the centerline of each major roadway in the vicinity of the planning area, and lists distances from the roadway centerlines to the 60-dBA, 65-dBA, and 70-dBA L_{dn} traffic noise contours. These traffic noise modeling results are based on existing peak-hour traffic volumes. As shown in Table 2-16, the location of the 60-dBA L_{dn} contour ranges from 5 feet to 202 feet from the centerline of the modeled roadways. The extent to which existing land uses in the planning area are affected by existing traffic noise depends on their proximity to the roadways and their individual sensitivity to noise.

Table 2-16. Summary of Existing Traffic Noise Levels Modeled in the Vicinity of the Planning Area

Roadway	Segment From	Segment To	L_{dn}, 100 Feet from Roadway Centerline (dBA)	Distance (feet) from Roadway Centerline to L_{dn} Contour 70 dBA[1]	Distance (feet) from Roadway Centerline to L_{dn} Contour 65 dBA[1]	Distance (feet) from Roadway Centerline to L_{dn} Contour 60 dBA[1]
Tesla Road	Vasco Road	West of Vasco Road	64.6	44	94	202
Tesla Road	Vasco Road	East of Vasco Road	61.6	28	60	129
Vasco Road	Tesla Road	North of Tesla Road	58.8	18	39	83
Tesla Road	Greenville Road	West of Greenville Road	61.6	28	60	129
Tesla Road	Greenville Road	East of Greenville Road	59.7	21	45	96

Notes:

[1] Distance (feet) from Roadway Centerline to L_{dn} Contour

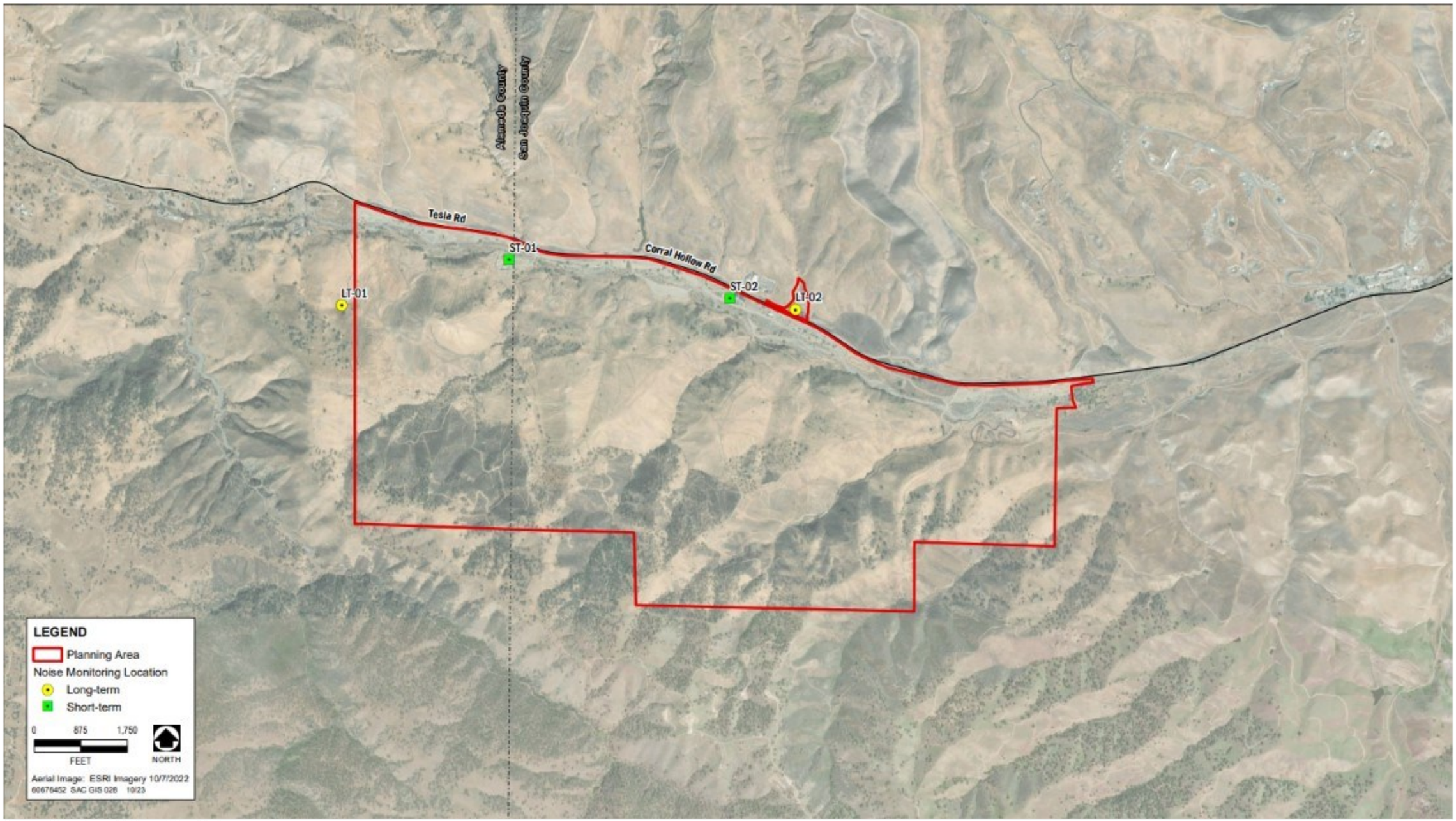
dBA = A-weighted decibels; EB = eastbound; I-580 = Interstate 580; L_{dn} = day-night average noise level; NB = northbound; SB = southbound; SVRA = State Vehicular Recreation Area; WB = westbound

Source: Modeled by AECOM in 2014

2.4 Operations and Maintenance

2.4.1 Facility Management

Carnegie SVRA and Diablo Range District staff members provide facility maintenance for the SVRA. Tracks are groomed once a week throughout the year. Grooming may require the use of a dozer, a farm disc, and a 4WD tractor. Tracks require watering in the summer months to control dust and minimize soil movement. A 4,000-gallon water truck runs loops around all tracks, as needed, with an estimated water use of 10 loads or 40,000 gallons per day. The 4x4 challenge area requires watering approximately biweekly, with an estimated 8,000 gallons of water per week added to the 4x4 mud pit during the summer months. Based on water use at the Carnegie SVRA and at other SVRAs with similar facilities and climates, Carnegie SVRA is estimated to require approximately 5.9 million gallons of potable water per year, and approximately 8.4 million gallons of non-potable water per year for such functions as irrigation and dust suppression. Water is supplied by on-site wells.



Source: State Parks 2012, AECOM 2013

Figure 2-22. Noise Measurement Locations

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Dust control products (e.g., Dust-Off) are applied to roads and staging areas as needed, usually once per year in the spring, to control fugitive dust. Approximately once per year, usually in the spring, an imported amendment of sand, rice hulls, chip bark, bark mulch, and/or topsoil (approximately 640 cubic yards per year) is incorporated into the tracks for texture and to control dust by holding moisture. The 4x4 challenge area requires regrading to smooth out ruts and depressions, approximately biannually when soils are still damp. Adding amendments and resurfacing may require the use of a dozer, a farm disc, and a 4WD tractor.

2.4.1.1 Staffing

Carnegie SVRA currently employs 24 full-time employees and 20-30 seasonal employees This includes State Parks Peace Officers (SPPOs), maintenance and administrative staff members, an interpreter, an environmental scientist, and visitor services staff members. SPPOs patrol the SVRA and use office space at the entrance station. Maintenance staff members work throughout Carnegie SVRA. Visitor services employees staff the entry kiosk, provide office support, and work at the entrance station. It is estimated that on average, approximately 20 staff members will be on-site at a time. The interpreter and environmental scientists work throughout the SVRA. The interpreter team occupies office space in the Carnegie SVRA Sector office, and the environmental science team works out of the Diablo Range District office. Staffing levels increase as needed during special events.

2.4.2 Public Safety

SPPOs patrol the SVRA seven days a week and provide all public safety functions. Three SPPOs live in state housing on-site and are available to respond to emergencies in the area when notified by a law enforcement dispatch, and for after-hours call-outs during campground emergencies. Emergency services can be contacted by calling 911 and radio communications are available to emergency responders on-site. Calls for service are routed to the Northern Communication Center in Rancho Cordova, which dispatches locally based peace officers to the calls.

The Alameda County Sheriff's Office is the main provider of police services in unincorporated Alameda County, outside of Carnegie SVRA. The dispatch center in San Leandro receives all 911 calls directly and patrols are dispatched from there. Calls for fire and medical services are sent to the dispatch center in Livermore (Alameda County Local Agency Formation Commission [LAFCo] 2017).

The San Joaquin County Sheriff's Department provides police service in unincorporated San Joaquin County. All operations are conducted from the San Joaquin County Sheriff's office located in French Camp. At the request of the SVRA staff, the San Joaquin County Sheriff's Department's Off-Road Enforcement Unit sometimes assists with special events within Carnegie SVRA. The peak season for OHV recreation is October 1 to April 30.

State Parks has a mutual aid relationship with both counties. SPPOs respond to emergencies outside of the SVRA when notified by the local sheriff's department or California Highway Patrol.

2.4.2.1 Emergency Services

Fire Protection

The planning area is located within a State Responsibility Area as identified by the California Department of Forestry and Fire Protection (CAL FIRE). The planning area is within the High Fire Hazard Severity Zone (CAL FIRE 2022).

The California Department of Forestry and Fire Protection's Santa Clara Ranger District has primary responsibility for fire protection in the planning area. The Alameda County Fire Department operates Alameda County Fire Station #21 at LLNL Site 300, approximately 5 minutes travel time from Carnegie SVRA, and the closest air tankers are stationed in Hollister, about 25 minutes away (State Parks 2000:2-12, 3-2).

The Carnegie SVRA's existing on-site roads and trail network serve as a firebreak system. Designated segments of the multiple-use trail system provide emergency access for wildfire suppression. State Parks staff members also maintain a truck with a water tank and pumping capability on-site. Fire tools and limited water supplies are carried by patrol vehicles. During periods of high fire danger, temporary closures may also be implemented for 4WD vehicles and other vehicles equipped with catalytic converters.

Spark arrester provisions established by California Vehicle Code Section 38366(a) are enforced. These statutory requirements specify that all motorcycles and ATVs operated on forest-, brush-, or grass-covered public lands must have U.S. Forest Service–approved or equivalent spark arresters.

Medical Aid

The SPPOs who patrol the planning area are peace officers trained in emergency medical treatment and can coordinate an ambulance response if necessary. If no ranger is available, 911 can be called from either of two phones on-site, one located at the campground restroom and the other behind the ranger station at the entrance to the SVRA. Hospitals are located in Tracy and Livermore (State Parks 2013a).

Paramedics Plus provides emergency medical services and ambulance transport services throughout unincorporated Alameda County (Alameda LAFCo 2012:2, 12, 13). American Medical Response San Joaquin provides emergency and nonemergency medical transport service in San Joaquin County (AMR 2013). This medical transport includes helicopter service out of the Fremont and Stockton airports. The nearest trauma centers are in Oakland and Fremont.

Emergency Access/Egress

I-580 provides regional emergency access to the planning area, while Corral Hollow Road and Tesla Road (together known as County Highway J2) provide local access from Tracy and Livermore, respectively. A private north-to-south road providing access to Corral Hollow Road, crosses the eastern portion of Carnegie SVRA. The main park road parallels Corral Hollow Road and provides access to the SVRA's eastern and western portions from the main entrance. Law enforcement and emergency response vehicles access the interior of Carnegie SVRA via the roads and trails established within the SVRA.

2.5 Interpretation and Education

2.5.1 Existing Interpretation and Education

Before 2009, ranger staff carried out interpretation and education at Carnegie SVRA. The open-air booth next to the concession store was staffed by retired ranger Bill Carter, who shared information with recreationists about recreational opportunities, rider safety, and news about the SVRA. He also provided tours of the SVRA's historic resources for local school groups and the public. Stock interpretive panels about wildlife, created by State Parks' Interpretation and Education Division, were scattered randomly throughout the valley floor.

2.5.1.1 Personal Interpretation

In 2009 Carnegie SVRA hired a full-time State Park Interpreter. Personal interpretation at the SVRA is done at the booth next to the concession store, at special-events booths, in school programs both in the classroom and at the SVRA, and through tours for interested parties.

The booth by the concession is open one weekend day per week during red sticker riding season, October through April. Visitors can pick up a map of Carnegie SVRA or one of the other SVRAs, a map of all of the state's OHV opportunities, or a map of the State Park System. Brochures from Tread Lightly! are available with information about recreating responsibly. Park-specific brochures explain the history of Carnegie SVRA and provide information about OHV laws. A self-guided Junior Ranger program and a coloring book are available for children. Each week the interpreter selects a taxidermy specimen or artifact from the ranger office to display while talking about habitat and resource protection. Other topics

discussed include information about park management, habitat protection, local history, and recreational opportunities.

For special events, such as hare scrambles or the hillclimbs, the interpreter and staff provide information from a special-event booth, which is a 10-foot-square EZ UP tent with “Carnegie SVRA” and the OHV logo printed on it. Four tables with OHV tablecloths are used to display educational materials. In addition to the informational brochures, there is a kids’ craft table with animal-related crafts and an OHV tic-tac-toe game that teaches responsible recreation. Division staff helps staff the special-event booth during these events.

Carnegie SVRA’s school outreach program includes a program about local animals for children in kindergarten and first grade and a local-history program for third graders. The kindergarten program includes an animal-related story, animal puppets, and a few taxidermied specimens. There is a game in which students match body parts such as beaks, wings, talons, fur, and antennae to different animals. First graders play an “herbivore, carnivore, omnivore” game and look at reproductions of animal skulls to learn about adaptation. The program for third graders begins with a PowerPoint presentation on the history of Corral Hollow Canyon; students then use a map to locate historic events. The program ends with a giant chalk timeline that uses inches for years, starting with the students’ age and going back to the time Native Americans arrived in California. Some third-grade classes follow up by visiting the SVRA, where they learn about protecting archaeological sites as they explore the remains of Carnegie Brick and Pottery. All three programs are based on current common core standards.

In 2020, the interpreter added a drop-in Junior Ranger table by the Kids track area. The Drop-in Junior Rangers occurs every other Saturday during Red Sticker Season (October to April). There is a different theme each time and activities that include crafts related to the theme that can be taken home. The current themes are OHV Safety, Wildlife, Archaeology, Wildflowers, Tarantulas, Bats, Geology, and Birds of Prey. A history tour of the cultural sites that include coal mining and the Brick and Pottery Factory is offered every other month during Red Sticker Season. The Interpreter leads the tour on an ATV or dirt bike with visitors following on their own off-road vehicle. A binder of historical photos and a box with artifacts are shown during the tour. The information booth continues to be used the first Saturday of every month during Red Sticker Season.

“Roving”, where interpreters go throughout the park and make informal contacts with visitors, takes place on the weekends and sometimes weekdays. They hand out stickers and requesting permission to take pictures of the visitor enjoying the park to post Carnegie social media. Currently there is no school outreach program but there are efforts to restart it.

2.5.1.2 Nonpersonal Interpretation

Nonpersonal interpretation and education at Carnegie SVRA consists of social media (i.e., Facebook), brochures created to meet park needs, and an interpretive panels program.

Carnegie SVRA’s Facebook page enables SVRA staff to inform users of current conditions, recreational opportunities, and special events, and provides a tool for visitors to communicate with SVRA staff. Posts are made an average of two to three times per week and reach up to approximately 70,450 users.

The interpreter creates brochures in response to regulatory requirements and visitor requests for information. Examples include the brochures on Carnegie SVRA history and OHV laws mentioned above, and the brochure on protecting water quality required by the SWMP.

Carnegie SVRA’s Facebook and Instagram page enables SVRA staff to inform users of current conditions, recreational opportunities, and special events, and provides a tool for visitors to communicate with SVRA staff. Posts are made an average of two-three times per week and engage up to 3,500 users on Facebook and engage 11.7K on Instagram.

In 2021, Carnegie was added to Flip, an online resource that connects videos made by park interpreters to teachers and their students. On the site Carnegie has videos on the Carnegie Brick and Pottery Factory, Tesla Coal Mining, and Carnegie Riparian Zone.

Interpretation has created many brochures and handouts that inform the visitors on safety and upcoming events. Some include, ATV safety, spark arrestor information, Resource Management areas, volunteer opportunities, monthly events, etc. The interpreter creates brochures in response to regulatory requirements and visitor requests for information. Examples include the brochures on Carnegie SVRA history and OHV laws mentioned above, and the brochure on protecting water quality required by the SWMP.

Interpretive panels are placed at congregation points and for site-specific interpretation. Some are the stock animal panels from the Interpretation and Education Division, and some are temporary panels created to educate the public about SVRA projects and SVRA history. In spring 2014, a series of permanent panels about habitat preservation and protecting water quality was installed throughout the SVRA to meet the requirements of the SWMP. Six other interpretive panels have been added to the park. A panel on the upgrade to middle track road is used for the hillclimb event was also placed in the special event area. In 2022, a panel on why staying on trail is important was placed on the Los Osos trail. In 2023, four panels on the history of the Brick and Pottery Plant and town were placed at the Carnegie town site and kiln. Nonpersonal interpretation and education at Carnegie SVRA consists of social media (i.e., Facebook, Instagram), brochures created to meet park needs, and an interpretive panels program.

2.5.1.3 Interpretive and Museum Collections

The following interpretive materials are currently available at Carnegie SVRA:

- Taxidermy specimens at the ranger station include two bobcats, a great horned owl, various snakes (including rattlesnakes and a whipsnake), a roadrunner, a weasel, and a turkey vulture. None of these specimens are in good condition; all are old and well-used.
- An electronic archive of historic and other photos has been compiled and is kept at the Twin Cities District office. Labeled CDs of historic photos are kept in the Carnegie Sector office.
- A cache of photos from the late 20th century is kept at the sector office. These photos, which were taken or collected by former Carnegie ranger Bill Carter, have not yet been archived. Photo albums full of newspaper clippings are also kept at the sector office.
- Museum collections include various historic and prehistoric artifacts, which are displayed in cases in the ranger office.

2.5.1.4 Past Interpretive Planning

The “Interpretive Element” chapter of the 1981 *Unit 272, Carnegie State Vehicular Recreation Area General Plan* describes the SVRA’s primary and secondary interpretive topics and sets the interpretive direction for the unit (State Parks 1981:42–43). Interpretive services focus on OHV recreation, safety, and interpreting cultural and natural resources. Interpretive topics included:

Primary:

1. OHV Recreation and Safety
    a. Carnegie SVRA: An Orientation
    b. Safety and Skills Enhancement
    c. The OHV and the Environment
    d. OHV Evolution and History

Secondary:

1. The Rise and Fall of Carnegie Brick and Pottery Company

2. The Natural Features of Carnegie

2.5.2 Local, Regional, and Statewide Context

Few OHV recreation areas are located within 50 miles of Carnegie SVRA. Cultural and natural resources within Carnegie include the footprint of the Carnegie brick factory, the existing kiln from the factory days, and critical California red-legged frog habitat, California tiger salamander habitat and western spadefoot toad populations. For this reason, information regarding OHV use and environmental responsibility is an important component of education at this park unit.

2.5.3 Support for Interpretation and Education

Carnegie SVRA has one full-time State Park Interpreter I and one seasonal Park Aide. No volunteers or organizations are currently involved with interpretation and education.

2.5.4 Interpretation Issues, Opportunities, and Constraints

In a 2012 survey, the General Plan team asked respondents what topics would be of interest regarding educational opportunities. Respondents chose OHV riding skills as their greatest preference, followed closely by history and wildlife.

2.6 Park Support

2.6.1 Volunteers

Volunteers are an important component to the operation of Carnegie SVRA. State Parks recruits volunteers through word of mouth, Facebook, the California Employment Development Department, and by contacting those who express an interest.

Volunteers are recruited mainly as safety patrol volunteers. These volunteers patrol the property, roads, and trails of Carnegie SVRA by foot and on motorcycles, ATVs, and other designated OHVs, checking for hazardous conditions, disabled vehicles, injured riders, and other unsafe or unusual occurrences. Safety patrol volunteers report safety hazards to SVRA staff members and provide medical assistance in accordance with State Parks policy to ill or injured visitors upon the direction of Carnegie SPPOs.

Carnegie SVRA staff members are also developing a base of resource volunteers to help with trail evaluations, bird/reptile surveys, and a site seed nursery.

Carnegie SVRA also participates in the California Archaeological Site Stewardship Program (CASSP), a statewide program, directed by the Society for California Archaeology. CASSP volunteers regularly visit assigned sites at the SVRA and report on their conditions to the State Park archaeologist. By regularly monitoring sites, problems are detected early, when they can more easily be corrected. Volunteers attend a 2-day training workshop before they become site stewards and typically make one site visit (about 8 hours) a month.

As of September 2021, there is a Volunteer Trail Maintenance crew of about 3 volunteers and one staff lead from the Natural Resources Trail crew. The volunteers help maintain the current trails.

The interpreter is the volunteer coordinator and does the recruitment, training, email reminders of meeting dates, and records the hours of the current volunteers.

2.6.2 Cooperating Associations and Supporting Groups

Carnegie SVRA has the support of several organizations and groups that provide a variety of tasks. These groups and the public outreach services they provide to Carnegie SVRA, or the community, are listed below:

- *Blue Ribbon Coalition* volunteers describe how to recreate on OHVs in an environmentally responsible manner.
- *District 36 Motorcycle Club* volunteers educate riders on sound requirements. They offer free sound testing and free installation of sound equipment.
- *California Off-Road Vehicle Association* volunteers explain new OHV regulations and OHV safety to the public.
- *Carnegie Advisory Team* is made up of a group of public stakeholders who meet monthly with Carnegie staff to provide input on park projects and operations that relate to the user's recreational experience and safety. The goal of this group is to give stakeholders a voice with park staff to present ideas, complaints, and views on current and future projects, operations, and public outreach. This partnership allows management to hear the visitor's ideas and concerns and consider them when making decisions on activities that will affect the park. The partnership also brings transparency to the stakeholders on management decisions regarding park planning and operations.

2.7 Planning Influences

2.7.1 Systemwide Planning

A variety of factors must be considered when making planning decisions for a SVRA. To understand land use, resource, and facility issues in a larger context, planning for a SVRA must consider issues that cross regional, local, and park boundaries. Therefore, State Parks addresses SVRA planning issues from a perspective that includes the entire State Parks system. In addition, other federal and state agencies may be responsible for providing oversight of various resources present in SVRAs. The following systemwide directives are relevant to the planning effort for Carnegie SVRA:

- State Parks mission statement
- OHMVR Division mission statement
- OHMVR Division Strategic Plan
- State Parks Strategic Initiatives
- State Parks Strategic Action Plan
- State Parks Accessibility Guidelines
- Statewide Motorized Trail System
- California Public Resources Code
- Off-Highway Motor Vehicle Recreation Act
- *Soil Conservation Standard and Guidelines*
- *OHV BMP Manual for Erosion and Sediment Control*
- OHMVR Division Resource Management Protocols
- *OHMVR and Natural Resources Division Wildlife Habitat Protection Plan Framework*
- Declaration of Purpose, Carnegie SVRA

2.7.1.1 State Parks Mission Statement

The mission of State Parks is to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation.

2.7.1.2 Off-Highway Motor Vehicle Recreation Division Mission Statement

The mission of State Parks' OHMVR Division is to provide leadership statewide in the area of OHV recreation; to acquire, develop, and operate state-owned vehicular recreation areas; and to otherwise provide for a statewide system of managed OHV recreational opportunities through providing funding to other public agencies. The OHMVR Division also aims to ensure that quality recreational opportunities

remain available for future generations by providing for education, conservation, and enforcement efforts that balance OHV recreation impacts with programs that conserve and protect cultural and natural resources.

2.7.1.3 Off-Highway Motor Vehicle Recreation Division Strategic Plan

The *California State Parks Off-Highway Motor Vehicle Recreation Division Strategic Plan* (State Parks 2009a) provides guidance to the OHMVR Division on a strategic approach for administering SVRAs and a statewide financial assistance program that provides OHV-related activities. It reaffirms a commitment to protecting California's unique natural areas by providing for well-managed OHV recreation. The plan seeks to actively engage the public to achieve its goals through multiple approaches, including providing transparency in program management and providing opportunities for children to connect with the natural environment. The plan provides a road map for the OHMVR Division based on four strategic themes and five guiding principles. Based on these strategic themes and guiding principles, the OHMVR Division Strategic Plan adopts a framework of six goals for the OHMVR Program to meet its legislative mandates.

Strategic Themes

- *Emphasize the Basics*—Maintaining existing OHV areas in good condition and preventing environmental damage are central to the success of the OHMVR Program.
- *The Greening of OHV Recreation*—New technologies are becoming available which present opportunities for OHV recreation to be managed in ways that significantly reduce impacts to the environment.
- *Improving Technology*—New vehicles now available are far more capable than those sold in the past. The OHMVR Program must respond to these improvements in technology by providing facilities appropriate for more capable vehicles.
- *The New Gateway*—The OHMVR Program will take advantage of the opportunity presented by the presence of large numbers of young people and nontraditional user groups in OHV recreation areas by providing educational programs which teach appreciation of nature and the outdoors.

Guiding Principles

- *Sustainability*—We must manage lands and resources in such a way that they will be available for the enjoyment of many generations of Californians to come.
- *Transparency in Decision Making*—Restoring public trust in the administration of the OHMVR Program depends upon people understanding the reasons behind decisions made by program managers.
- *Working with Partners and Volunteers*—Meeting OHMVR Program goals is far too complex an undertaking to attempt without the assistance of numerous related agencies, and participation from individuals and volunteer organizations.
- *Considering the Needs and Concerns of Stakeholders*—The OHMVR Program will only be relevant to the degree to which it responds to the needs and concerns of those who are most invested in the success of the OHMVR Program.
- *Sound Data for Management Decision Making*—In an era of diminishing opportunities, there is little room for mistakes. Commitment of resources and management actions must be based on the best available information to ensure success.

Goals

- *Goal 1—Sustain Existing Opportunity:* Protect, preserve, and enhance existing OHV opportunities in a manner that ensures well-managed, interesting, and high-quality experiences, and address the environmental impacts that may be associated with those activities.
- *Goal 2—Increase OHV Opportunity:* Add new OHV opportunities where appropriate and needed to replace loss of existing opportunities and respond to changing and future demand.

- *Goal 3—Staff Development:* Enhance the abilities of program managers and staff dedicated to the development, management, and implementation of the OHMVR Program.
- *Goal 4—Develop an Informed and Educated Community:* Achieve a highly informed and educated community associated with OHV recreational activities, dedicated to safe and lawful OHV operation and responsible environmental stewardship.
- *Goal 5—Cooperative Relationships:* Establish and maintain productive relationships between individuals, organizations, industry, and government agencies to cooperatively identify problems and develop and implement solutions to advance the Mission and Goals of the OHMVR Program.
- *Goal 6—Informed Decision Making:* Improve the quality, quantity, and accessibility of information needed to support sound decision making, transparency of administration, and communication with the interrelated groups interested in, and associated with, the OHMVR Program.

2.7.1.4 State Parks Strategic Initiatives

State Parks Strategic Initiatives are the implementation strategy for the Strategic Vision of State Parks, the image of the future of the State Parks system (State Parks 2001). Each initiative has its own implementation plan and outcome. They have been crafted to correspond with State Parks' philosophy to preserve, protect, and interpret California's natural, cultural, and recreational resources. The Strategic Initiatives include:

- increasing diversity and leadership,
- using technology,
- creating an urban connection,
- developing a new image,
- focusing on cultural resources, and
- expanding recreational opportunities.

2.7.1.5 State Parks Strategic Action Plan

The *Strategic Action Plan, "Brilliance in the Basics," 2013–2014* sets the direction for State Parks' actions over the next 2 years while a long-term plan for stewarding California's park system in and through the 21st century is developed (State Parks 2013b). It includes the following vision:

> California State Parks will strive for a future in which Californians are healthier in mind, body and spirit through discovering, enjoying and learning about California's extraordinary parklands and diverse heritages. California State Parks makes these treasured natural and cultural resources and wide-ranging recreational opportunities available to all. Californians protect and expand this State Parks legacy for future generations.

The goals of the *Strategic Action Plan* are:

(1) Restore public trust and accountability.
(2) Protect and preserve resources and facilities in the existing State Park System.
(3) Maintain the cleanest park facilities and restrooms in the country.
(4) Connect people to California's State Park System.
(5) Build the foundation for a sustainable future.

2.7.1.6 California State Parks Accessibility Guidelines

The *California State Parks Accessibility Guidelines* "are intended to convey to State Parks staff general information regarding accessibility standards and recommendations for complying with laws and regulations related to accessibility" (State Parks 2015b). The guidelines provide practical ways to allow people of all abilities to access and use programs and facilities while maintaining the quality of experience people come to a State Park to enjoy. The guidelines also offer recommendations and regulations for complying with the standards for accessibility.

2.7.1.7 California Public Resources Code

California PRC Sections 5019.50 through 5019.80, "Classification of the State Parks System," provide guidelines for the designation of State Parks and guiding principles for park improvements. The PRC classifies different types of State Parks units and provides guidelines for the upkeep and improvements of parks. It is also used as a general guide to plan appropriate improvements. In PRC Sections 5090.01 through 5090.70, the Off-Highway Motor Vehicle Recreation Act of 2003 provides more detailed planning guidance specific to SVRAs. PRC Section 5090.35(a) states:

> The protection of public safety, the appropriate utilization of lands, and the conservation of land resources are of the highest priority in the management of the state vehicular recreation areas. Additionally, the division shall promptly repair and continuously maintain areas and trails, anticipate and prevent accelerated and unnatural erosion, and restore lands damaged by erosion to the extent possible. The division shall take steps necessary to prevent damage to significant natural and cultural resources within state vehicular recreation areas.

PRC Section 5090.43(a) states:

> State vehicular recreation areas consist of areas selected, developed, and operated to provide off-highway vehicle recreation opportunities. State vehicular recreation areas shall be selected for acquisition on lands where the need to establish areas to protect natural and cultural resources is minimized, the terrain is capable of withstanding motorized vehicle impacts, and where there are quality recreational opportunities for off-highway motor vehicles. Areas shall be developed, managed, and operated for the purpose of providing the fullest appropriate public use of the vehicular recreational opportunities present, in accordance with the requirements of this chapter, while providing for the conservation of cultural resources and the conservation and improvement of natural resource values over time.

2.7.1.8 California Statewide Motorized Trail System

PRC Section 5090.44 provides for the designation of corridors in California as Statewide Motorized Trails, corridors designated and maintained for recreational travel by OHVs. Portions of a California Statewide Motorized Trail may include lands designated and maintained as trailheads. No designated trail corridors are envisioned to be located near Carnegie SVRA.

2.7.1.9 Soil Conservation Standard and Guidelines

The 2008 *Soil Conservation Standard and Guidelines* (Soil Standard) (State Parks 2008) requires that State Parks' OHMVR Division manage OHV recreation facilities to meet the following standard:

> OHV recreation facilities shall be managed for sustainable long-term prescribed use without generating soil loss that exceeds restorability, and without causing erosion or sedimentation which significantly affects resource values beyond the facilities. Management of OHV facilities shall occur in accordance with Public Resources Code, Sections 5090.2, 5090.35, and 5090.53.

The Soil Standard's guidelines were updated in 2020, consistent with Senate Bill 249, requiring State Parks to "…review, and if deemed necessary, update the Soil Conservation Standard and Guidelines to establish a generic and measurable soil conservation standard by December 31, 2020 (PRC, Section 5090.35 (b))." The review process found that the 2008 Soil Conservation Standard and Guidelines provided an effective framework for soil resource conservation for the OHV management, but some updates to the document were still required. The Soil Standard's guidelines provide tools and techniques that may be used to meet this standard. Other tools and techniques that are more applicable to specific facility conditions and organizational protocols also may be used for compliance as appropriate.

The Soil Standard provides guidance for conserving soil in SVRAs and includes measures to maintain trails to a standard that allows for feasible restoration by natural resource managers. The Soil Standard applies to OHV areas funded by the OHV Trust Fund, including all SVRAs. In the context of the Soil

Standard and the PRC, “restoration” means upon closure of the unit or any portion thereof, the restoration of land to the contours, the plant communities, and the plant covers comparable to those on surrounding lands or at least those that existed prior to off-highway motor vehicle use. The Soil Standard also provides measures to help anticipate and prevent accelerated and unnatural erosion, and to guide the maintenance and repair of trails.

2.7.1.10 Off-highway Vehicle Best Management Practices Manual for Erosion and Sediment Control

The OHV BMP Manual (State Parks 2007b) provides guidance on selecting, implementing, and maintaining BMPs for OHV-type facilities and construction activities. The manual provides details on BMPs for erosion control (e.g., blankets, mulches, hydroseeding techniques), scour control (e.g., check dams and armoring as in upland swales and ditches), dust control, sediment traps, and waste management.

2.7.1.11 Off-Highway Motor Vehicle Recreation Act and OHMVR Commission

The OHMVR Act requires the OHMVR Division to implement and administer the OHMVR Program, which provides and supports sustainable, ecologically based opportunities for OHV recreation at specified areas throughout the state (PRC Section 5090 et seq.). The OHMVR Act states that ecologically balanced recreation requires effectively managed areas and adequate facilities for the use of OHVs, conservation, and enforcement.

The duties and responsibilities of the OHMVR Commission are advisory in nature, in line with those of the California State Park and Recreation Commission. Nine commissioners are appointed to represent a broad range of groups: OHV recreation enthusiasts, biological or soil scientists, rural landowners, law enforcement, environmental protection organizations, and nonmotorized recreation interests. The commission reviews plans for new and expanded vehicle recreation areas that have applied for grant funds, reviews and comments on the strategic plans and general plans developed by the OHMVR Division, receives public comment on the plans, and reports to the Governor and various legislative committees.

2.7.1.12 Off-Highway Motor Vehicle Recreation Division Resource Management Protocols

The WHPP (mandated by PRC Section 5090.35) is a major part of each SVRA’s resource monitoring and evaluation program. The WHPP emphasizes a broad range of scientifically accepted techniques and measures that are appropriate for the unique habitats found within each SVRA. This monitoring system provides information on protocols for baseline studies, focused studies, monitoring, and surveys, and is used by SVRA resource managers to aid in the development of park-specific monitoring plans and techniques.

The goals of the WHPP are to monitor and manage wildlife and plant populations and restore habitats where necessary to sustain a viable species composition within each SVRA. The plan enables adaptive management, allowing management practices and strategies to change, or “adapt,” as warranted by new monitoring information. Environmental scientists for each SVRA conduct and oversee the monitoring based on the WHPP and other monitoring protocols. Biological resource assessments conducted at Carnegie SVRA have been compiled according to the guidelines set forth by this system.

2.7.1.13 Carnegie SVRA Declaration of Purpose

The Declaration of Purpose is the broadest statement of management goals designed to fulfill the vision for a State Park unit and provides direction for the development of the General Plan. It is required by PRC Section 5002.2(b) and describes a unit’s primary resource values, significance, opportunities, and value to the State Parks System.

Carnegie SVRA's Declaration of Purpose was approved in December 1981 (State Parks 1981:21):

> The primary purpose of Carnegie State Vehicular Recreation Area is to make available to the public opportunities for recreation use of off-highway vehicles, to manage this use in the interest of visitor safety and long-term use of the site for off-highway-vehicle recreation, to provide appropriate related facilities to serve the needs of present and future off-highway-vehicle users; and to protect, perpetuate, and interpret special natural, scenic, and cultural values in the unit.
>
> The prime resource of Carnegie SVRA is the recreational value of the Corral Hollow Creek floodplain and the adjacent hillside slopes. Certain natural and cultural values in the unit are also prime resources, and can provide recreational and interpretive opportunities, as well as opportunities for scientific study.

2.7.2 Regional Planning

As a state agency, State Parks is not subject to city, county, or regional plans. However, the Carnegie SVRA General Plan takes these plans into account to promote a better coordinated landscape. Figure 2-23 shows land uses as designated by the general plans of Alameda and San Joaquin Counties.

2.7.2.1 Alameda County

General Plan

The following elements of the *Alameda County General Plan* are applicable to the planning area:

- The *Park and Recreation Element*, commonly known as the Recreation Plan, is an official guide to developing various levels of parks and recreation systems, and to directing zoning and other actions toward the goal of providing adequate and appropriate parks and recreation areas to serve all of Alameda County (Alameda County 1994a:2).
- The *Open Space Element* (Alameda County 1994b) establishes official basic policy regarding coordination of open-space proposals and programs among federal, state, regional, county, and city governments and special districts, and between local governments and private landholders.
- The *Scenic Route Element* (Alameda County 1994c) designates Tesla Road as a scenic rural recreation route. The plan calls for design review, landscaping standards, and avoiding cut and fill along scenic routes. The *East County Area Plan* (Alameda County 2002) is incorporated into the *Alameda County General Plan* and addresses area-specific issues (land use, open space, circulation, noise, seismic hazards, public facilities and services). The plan has legal regulatory effect only in currently unincorporated areas in eastern Alameda County. The open space and land use diagrams in the *East County Area Plan* identify the portion of Carnegie SVRA located in Alameda County as large-parcel agriculture and parkland. The plan also identifies the SVRA as an existing state park. The plan's map of major park facilities and regional trails identifies a proposed regional corridor trail that crosses the western edge of the SVRA.

Zoning

The Alameda County Zoning Ordinance presents a comprehensive guide for development in Alameda County. Although the Zoning Ordinance does not directly apply to state-controlled properties, it does directly affect the surrounding land uses, and therefore, the overall context of the planning area.

The portion of Carnegie SVRA that is located in Alameda County is zoned by the County as Agriculture (AG) (Alameda County 2022a). As described in Section 17.06 of the Alameda County Zoning Code, this district promotes implementation of general plan land use proposals for agricultural and other nonurban uses, to conserve and protect existing agricultural uses, and to provide space for and encourage such uses in places where more intensive development is not desirable or necessary for the general welfare. Permitted land uses include single-family dwelling units; agricultural land uses, including crop, vine or tree farm, truck garden, plant nursery, greenhouse, apiary, aviary, and horticulture; wineries, microbreweries,

or olive oil mills; grazing and breeding of horses and cattle; fish hatcheries and rearing ponds; private and public hiking and riding trails; and boarding stables (Alameda County 2022b).

2.7.2.2 San Joaquin County

General Plan

San Joaquin County updated its entire general plan in 2016. Carnegie SVRA is located in the general plan's Tracy Planning Area. This planning area has been affected by growth in the San Francisco Bay region, especially employment growth in Livermore, Pleasanton, and San Ramon. Proximity to these job centers and relatively affordable housing has made Tracy one of San Joaquin County's fastest growing communities (San Joaquin County 1995:XII-1). A narrow strip of Carnegie SVRA along Corral Hollow Road is designated as Open Space–Resource Conservation and the rest of the SVRA in San Joaquin County is designated as Public Land (Figure 2-23).

In San Joaquin County, I-580 and a portion of Interstate 5 are designated as scenic highways by the State of California. Other routes in the county have been designated as scenic, including Corral Hollow Road, which provides access to Carnegie SVRA from I-580 (San Joaquin County 1992: Figure II.E-7).

Zoning

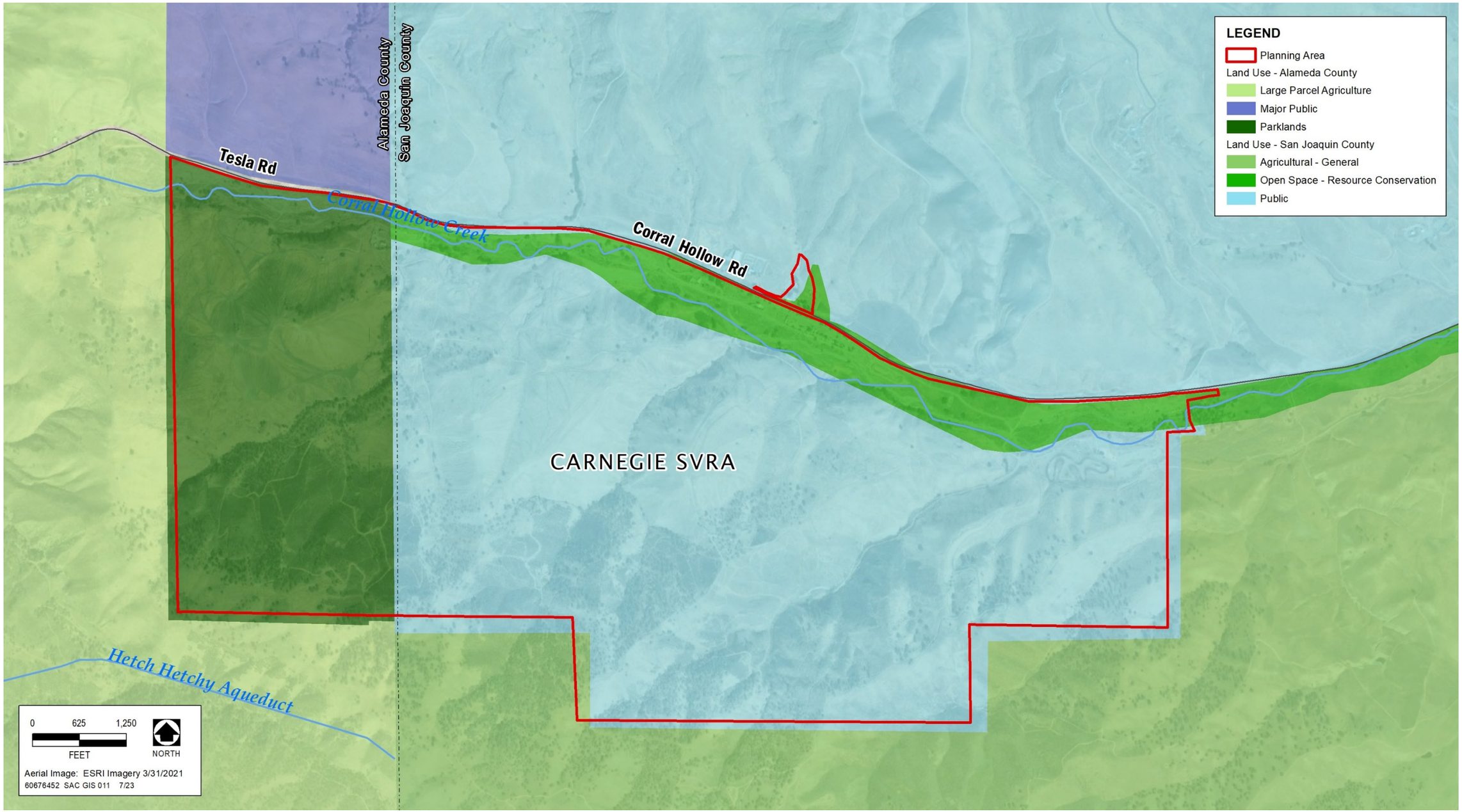
The San Joaquin County Zoning Ordinance is codified as Title 9 of the County Code. The planning area is designated by the County as AG-160 (General Agriculture, 160-acre minimum parcel size) (San Joaquin County 2017b). The AG zone is established to preserve agricultural lands for the continuation of commercial agricultural enterprises. Permitted land uses include single-family dwelling units, general animal raising, family food production, crop production, and minor utility services (San Joaquin County 2022). Parks, nature preserves, and campgrounds are permitted uses with issuance of a use permit (San Joaquin County 2022).

2.7.2.3 Other Regional Plans

The Association of Bay Area Governments (ABAG) is the metropolitan planning organization (MPO) for nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. ABAG and the Metropolitan Transportation Commission (MTC) have prepared the *Plan Bay Area*, an integrated long-range transportation and land-use/housing plan for the San Francisco Bay Area. The *Plan Bay Area* includes the Bay Area's regional transportation plan, which the MTC updates every 4 years, and ABAG's demographic and economic forecast, which is updated every 2 years. The *Plan Bay Area* functions as the Sustainable Communities Strategy for the MTC and ABAG, coordinating land use and transportation in the regional transportation plan. Taken together, the land-use patterns and transportation investments aim to reduce GHG emissions for cars and light-duty trucks in the nine-county region. The *Plan Bay Area* was jointly adopted by the ABAG Executive Board and the MTC on October 21, 2021, and covers the time period through 2050 (ABAG and MTC 2021).

2.7.3 Regulatory Influences

Regulatory influences should be understood if regulatory issues are to be anticipated and incorporated during the planning for Carnegie SVRA. Regulatory programs pertinent to the SVRA are described below, separated by topic and then grouped by level of government (federal, state, regional, or local).



Sources: Alameda County 2002 adapted by AECOM, San Joaquin County 2023

Figure 2-23. County-Designated Land Uses in and near the Planning Area

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2.7.3.1 Natural Resources

Federal Regulations and Laws

Federal Endangered Species Act

Species listed under the federal ESA could be present in or near the planning area. USFWS has authority over projects that may result in the "take" of a species listed as threatened or endangered under the ESA. Section 9 of the ESA defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Federal regulations define take further to include habitat modification or degradation that would be expected to result in death or injury to listed wildlife. If a project would result in the take of a federally listed species, either an incidental take permit under ESA Section 10(a) or a federal interagency consultation under ESA Section 7 is required before the take may occur. Typically, the project proponent must minimize and compensate for take as a condition of such a permit.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act, first enacted in 1918, implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international protection of migratory birds. The Migratory Bird Treaty Act authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act makes it unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (U.S. Code Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the Migratory Bird Treaty Act includes several hundred species and includes nearly all native birds.

Clean Water Act Section 404

EPA is the lead federal agency responsible for water quality management. The CWA is the primary federal law that governs and authorizes water-quality control activities by EPA and the states.

CWA Section 404 requires a project proponent to obtain a permit from USACE before engaging in any activity that involves discharging dredged or fill material into waters of the United States, including wetlands. The relevant terms are generally defined as follows:

- *Fill material:* Any material that replaces a portion of a water of the United States with dry land or changes the bottom elevation of a portion of a water of the United States.
- *Waters of the United States:* traditional navigable waters, the territorial seas, and interstate waters; impoundments of ‘‘waters of the United States’’; tributaries to traditional navigable waters, the territorial seas, interstate waters, or impoundments when the tributaries meet either the relatively permanent standard or the significant nexus standard; and many wetlands (33 Code of Federal Regulations [CFR] Part 328).
- *Wetlands*: Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Jurisdictional wetlands must meet three criteria: hydrophytic vegetation, hydric soil, and wetland hydrology. They must be adjacent to waters of the US, adjacent to and with a continuous surface connection to relatively permanent impoundments or jurisdictional tributaries when the jurisdictional tributaries meet the relatively permanent standard, or adjacent to paragraph impoundments or jurisdictional tributaries when the wetlands meet the significant nexus standard.

Before USACE can issue a permit under CWA Section 404, it must determine that the project complies with the CWA Section 404(b)(1) guidelines. The Section 404(b)(1) guidelines (Title 40, Section 230.10[a] of the Code of Federal Regulations [40 CFR 230.10(a)]) include the following specific requirement:

> [N]o discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. …

To comply with this provision, the applicant must evaluate opportunities that would result in a less adverse impact on the aquatic ecosystem.

In 2008, USACE and EPA issued regulations governing compensatory mitigation for activities authorized by permits issued by USACE. These regulations establish a preference for the use of mitigation banks to reduce some of the risks and uncertainties associated with compensatory mitigation.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (Eagle Act) prohibits the taking or possession of and commerce in bald and golden eagles, including their parts, nests, or eggs, with limited exceptions. The Eagle Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 U.S. Code 668–668d). USFWS has defined "disturb" under the Eagle Act as follows (87 *Federal Register* [FR] 884, January 7, 2022):

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

USFWS has proposed new permit regulations to authorize the take of bald and golden eagles under the Eagle Act, generally when the take to be authorized is associated with otherwise lawful activities (87 FR 884, January 7, 2022). With the delisting of the bald eagle in 2007, the Eagle Act is the primary federal law protecting bald eagles, as well as golden eagles.

State Regulations and Laws

California Endangered Species Act

The CESA directs state agencies to decline approval of projects that would jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of habitat essential to a species' continued existence. Furthermore, the CESA states that reasonable and prudent alternatives must be developed by CDFW together with the project proponent and any state lead agency. These reasonable and prudent alternatives must be consistent with conserving the species while maintaining the project purpose to the greatest extent possible. CESA defines "take" of a species as an activity that would directly or indirectly kill an individual of a species. Unlike the federal ESA's definition, the CESA's definition of take does not include "harm" or "harass." As a result, the threshold for take may be higher under the CESA than under the ESA because the CESA does not necessarily consider habitat modification to be take.

CESA Sections 2081(b) and 2081(c) allow CDFW to issue an incidental take permit for a state-listed threatened and endangered species only if certain criteria are met. Specifically, the take must be incidental to an otherwise lawful activity; the impacts of the authorized take must have been minimized and fully mitigated; and issuance of the permit must not jeopardize the continued existence of a state-listed species.

CDFW maintains a list of species considered threatened and endangered under the CESA. In addition, CDFW maintains lists of candidate species and species of special concern. Candidate species are those species under review for addition to the list of either threatened or endangered species. "Species of special concern" status applies to animals that are not listed under the federal ESA or CESA, but that nonetheless are declining at a rate that could result in listing; it also applies to animals that have

historically occurred in low numbers, for which known threats to their persistence currently exist. The designation is intended to result in special consideration for these animals during environmental review.

California Fish and Game Code

Fully Protected Species

Sections 3511, 4700, 5050, and 5515 strictly prohibit the incidental or deliberate take of fully protected species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock; therefore, avoidance measures may be required to avoid take of fully protected species.

Protection of Bird Nests

Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy raptors (e.g., hawks, owls, eagles, falcons), including their nests or eggs.

Lake and Streambed Alteration

Under Section 1602, rivers, streams, and lakes in California are subject to regulation by CDFW. CDFW regulates diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake. As defined by CDFW, a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and that supports fish or other aquatic life.

Porter-Cologne Water Quality Control Act and Section 401 of the Clean Water Act

Under Section 401 of the federal CWA, an applicant for a Section 404 permit must obtain a certificate from the appropriate state agency stating that the intended dredging or filling activity is consistent with the state's water quality standards and criteria. In California, the State Water Resources Control Board (SWRCB) has delegated the authority to grant water quality certification to the nine RWQCBs. The planning area is under the jurisdiction of the Central Valley RWQCB.

Each of the nine RWQCBs must also prepare and periodically update a basin plan in accordance with the Porter-Cologne Act. Each basin plan sets forth water quality standards for surface water and groundwater and actions to control nonpoint and point sources of pollution. These actions seek to achieve and maintain the basin plan standards. Basin plans offer an opportunity to protect waterways and wetlands by establishing water quality objectives.

The RWQCB's jurisdiction includes federally protected waters under CWA Section 401 and state-protected waters under the Porter-Cologne Act. A "water of the state" is defined as any surface water or groundwater, including saline waters, within the boundaries of the state. The RWQCB has the discretion to take jurisdiction over areas not federally protected under Section 401 if they meet the definition of waters of the state. The RWQCB typically requires the project proponents to mitigate impacts on waters and wetlands to ensure no net loss of functions and values.

California Department of Fish and Wildlife/California Native Plant Society Species Designations

CNPS is a statewide nonprofit organization that seeks to increase understanding of California's native flora and to preserve this rich resource for future generations. CDFW and CNPS assign rare plant ranks through the collaborative efforts of the Rare Plant Status Review Group composed of more than 300 botanical experts from government, academia, nongovernment organizations, and the private sector and managed jointly by CDFW and CNPS.

California native plants meeting the rarity or endangerment criteria are assigned a CRPR. These plants were formerly referred to as CNPS listed species; however, in March 2010 CDFW (then known as the California Department of Fish and Game) adopted the name "California Rare Plant Rank" for the rarity and endangerment categories. The reason for this change was to eliminate the false impression that these assignments are the exclusive work of CNPS and that CNPS has had undue influence over the regulatory process.

CRPR 1 and 2 species generally qualify as endangered, rare, or threatened within the definition of the CEQA Guidelines (Title 14, Section 15380 of the California Code of Regulations [14 CCR Section 15380]). In general, CRPR 3 and 4 species do not meet the definition of endangered, rare, or threatened pursuant to CEQA Section 15380; however, these species may be evaluated by the lead agency on a case-by-case basis to determine significance criteria under CEQA.

2.7.3.2 Hydrology and Water Quality Regulations

Federal Regulations and Laws

Federal Clean Water Act

EPA is the lead federal agency responsible for managing water quality and implementing regulations adopted under the Clean Water Act of 1972. The CWA is the primary federal law authorizing EPA and individual states to implement water quality control activities and governs such activities. The various CWA elements that address water quality and are applicable to the Carnegie SVRA General Plan are discussed below. USACE administers wetland protection elements under Section 404 of the CWA, including permits for the discharge of dredged and/or fill material into waters of the United States.

Water Quality Criteria and Standards

CWA Section 303 requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: designated beneficial uses of the water body in question and criteria that protect the designated uses.

Section 304(a) requires EPA to publish advisory water quality criteria reflecting the latest scientific knowledge on the kind and extent of health and welfare effects expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use.

Water quality regulations are published in CFR Title 40. EPA has delegated authority to the State of California to implement and oversee most programs authorized or adopted for CWA compliance through the Porter-Cologne Act, described below.

National Pollutant Discharge Elimination System Permit Program

The NPDES permit program was established in the CWA to regulate municipal and industrial discharges to surface waters of the United States. In California, the nine RWQCBs implement the NPDES permit system. A discharge from a point source is unlawful unless the discharge complies with an NPDES permit. “Point-source” pollution is discharged from a distinct, identifiable source, such as a pipe or ditch, while “nonpoint-source” pollution occurs when runoff washes off a wide land area, such as a plowed field or city street. NPDES permits generally identify limits on allowable concentrations or mass emissions of pollutants contained in discharges; prohibit discharges not specifically allowed by the permit; and describe actions that the discharger must take, such as conducting industrial pretreatment, pollution prevention, and self-monitoring activities.

EPA maintains regulations that establish NPDES permit requirements for municipal and industrial stormwater discharges. An NPDES permit for general construction activity is required for projects that would disturb 1 acre or more. The NPDES General Permit for Small Municipal Separate Storm Sewer Systems, referred to as the “MS4 General Permit” requires small municipal areas of fewer than 100,000 persons to develop stormwater management programs.

Antidegradation Policy

The federal antidegradation policy, established in 1968, is designed to protect existing uses, water quality, and national water resources. The federal policy directs states to adopt a statewide policy that includes the following primary provisions:

- Existing instream uses and the water quality necessary to protect those uses shall be maintained and protected.

- Where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development.
- Where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

Federal Emergency Management Agency

FEMA administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. FEMA establishes the design standard for flood protection covered by the Flood Insurance Rate Maps. The minimum level of flood protection for new development is the 1-in-100 (1 percent) annual exceedance probability (the 100-year flood event). As developments are proposed and constructed, FEMA also issues revisions to Flood Insurance Rate Maps, such as Conditional Letters of Map Revision and Letters of Map Revision, through the local agencies that work with the National Flood Insurance Program.

State Regulations and Laws

In California, the SWRCB has broad authority over water quality control issues for the state. The SWRCB develops statewide policy on water quality and exercises the powers delegated to the state by the federal government under the CWA. Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. The Central Valley RWQCB is responsible for the regional area in which the planning area is located.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act is California's statutory authority for the protection of water quality. This law requires the state to adopt water quality policies, plans, and objectives that protect the state's waters. The Porter-Cologne Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update basin plans, regional water quality control plans that also are required by the CWA. Basin plans establish beneficial uses, water quality objectives (or "criteria" under the CWA), and implementation programs for each of the nine regions in California.

The Porter-Cologne Act also requires waste dischargers to notify the RWQCBs of their activities by filing reports of waste discharge. The SWRCB and RWQCBs are authorized to issue and enforce waste discharge requirements (WDRs), NPDES permits, Section 401 water quality certifications, or other approvals. The RWQCBs also may issue waivers to reports of waste discharge and/or WDRs for broad categories of "low threat" discharge activities that have minimal potential to adversely affect water quality when implemented according to prescribed terms and conditions.

California Toxics Rule and State Implementation Plan

The CTR was issued in 2000 in response to requirements of EPA's National Toxics Rule. The CTR establishes numeric water quality criteria for approximately 130 trace metals and organic compounds that have been identified as priority pollutants. The CTR criteria are regulatory criteria adopted for inland surface waters, enclosed bays, and estuaries in California that are subject to CWA Section 303(c). The CTR includes criteria for the protection of aquatic life and human health. Human health criteria (water- and organism-based) apply to all waters with a beneficial use designation of Municipal and Domestic Water Supply, as indicated in the basin plans.

The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, also known as the State Implementation Plan, was adopted by the SWRCB in 2000 and amended in 2005. The State Implementation Plan establishes provisions for:

- translating CTR criteria, National Toxics Rule criteria, and basin plan water quality objectives for toxic pollutants into effluent limits for NPDES permits;
- determining whether effluent levels are in compliance with those limits;
- monitoring for 2, 3, 7, 8-TCDD (dioxin) and its toxic equivalents;
- controlling chronic (long-term) toxicity;
- initiating development of site-specific water quality objectives; and
- granting exceptions for effluent compliance.

The goal of the State Implementation Plan is to establish a standardized statewide approach to the permitting of discharges of toxic effluent to inland surface waters, enclosed bays, and estuaries.

NPDES Permit System and Waste Discharge Requirements for Construction

The SWRCB and Central Valley RWQCB have adopted specific NPDES permits for activities that have the potential to discharge wastes to waters of the state. The SWRCB's statewide stormwater general permit for construction activity (WQ 2022-0057-DWQ) is applicable to all land-disturbing construction activities that would disturb 1 acre or more. The Central Valley RWQCB's general NPDES permit for construction dewatering activity (Order 5-00-175) authorizes direct discharges to surface waters up to 250,000 gallons per day for no more than a 4-month period each year.

To receive an NPDES permit, the discharger must submit a notice of intent to discharge to the Central Valley RWQCB and implement a storm water pollution prevention plan (SWPPP) that includes BMPs to minimize discharges. As mentioned above, the Central Valley RWQCB may issue site-specific WDRs or waivers to WDRs for certain waste discharges to land or waters of the state. Central Valley RWQCB Resolution R5-2003-0008 identifies activities subject to waivers of reports of waste discharge and/or WDRs, including minor dredging activities and construction dewatering activities that discharge to land.

Clearing, grading, stockpiling, and excavation are subject to the general construction activity permit. Dischargers must eliminate or reduce nonstormwater discharges to storm sewer systems and other waters. The permit also requires dischargers to consider using permanent postconstruction BMPs that would remain in service to protect water quality throughout the life of the project. All NPDES permits also have inspection, monitoring, and reporting requirements.

In addition, in response to a court decision, the Central Valley RWQCB adopted Resolution 2001-046, which requires that water quality be sampled to determine the presence of visible and nonvisible contaminants in discharges from construction activities. Water quality sampling must occur if the activity could result in the discharge of turbidity or sediment to a water body that is listed as impaired under Section 303(d) because of sediment or siltation, or if a nonvisible contaminant is released. Sampling and analysis are required when such pollutants are known or should be known to be present and have the potential to contact runoff. NPDES permits require implementation of design and operational BMPs to reduce the level of contaminant runoff. Types of BMPs include source controls, treatment controls, and site planning measures.

Discharges subject to the SWRCB NPDES general permit for construction activity are subject to development and implementation of a SWPPP. The SWPPP shows a site map, describes construction activities, and identifies the BMPs that would be employed to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, and cement) that could contaminate nearby water resources.

NPDES Municipal Storm Water Permitting Program

The SWRCB's Municipal Storm Water Permitting Program regulates stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined in 40 CFR 122.26(b)(8) as:

> … a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):
>
> – Owned or operated by a state, city, town, borough, or county… having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes… or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
>
> – Designed or used for collecting or conveying storm water;
>
> – Which is not a combined sewer; and
>
> – Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

The SWRCB adopted the MS4 General Permit (WQ Order No. 2013-0001-DWQ) to provide permit coverage for smaller municipalities. The MS4 permits require the discharger to develop and implement a stormwater management plan/program intended to reduce the discharge of pollutants to the maximum extent practicable. ("Maximum extent practicable" is the performance standard specified in Section 402[p] of the CWA.) The management plan specifies what BMPs will be used to address certain program areas: public education and outreach, detection and elimination of illicit discharges, construction and postconstruction, and municipal operations. In general, medium and large municipalities are required to conduct water quality monitoring, and small municipalities are not.

There are two types of small-MS4 permittees: regular and nontraditional. A nontraditional small MS4 is a stormwater system that serves public campuses, municipalities, military bases, prisons, or hospitals and is located within or discharges to a permitted MS4, or that poses a "significant threat" to receiving-water quality. The SWRCB and Central Valley RWQCB have not officially designated any MS4s as nontraditional. However, the SWRCB has developed an extensive list of operators that may be designated at any time. Carnegie SVRA is identified in the SWRCB's list of non-traditional small MS4 permittees and is thus required to comply with the Phase II Small MS4 Permit (SWRCB 2013).

Central Valley Basin Plan

Both the federal CWA and the Porter-Cologne Act mandate basin plans. The basin plan issued by the Central Valley RWQCB (2019) sets forth water quality standards for the surface waters and groundwater of the region. Those standards include both designated beneficial uses of the water, and the narrative and numeric objectives that must be maintained or attained to protect those uses. Generally, narrative criteria require that water quality not be degraded as a result of increases in pollutant loads that will adversely affect a water body's designated beneficial uses.

The Central Valley RWQCB's Basin Plan (Central Valley RWQCB 2019) does not specify beneficial uses or specific water quality objectives for Corral Hollow Creek. According to the tributary rule, the beneficial uses assigned to any downstream water body would also apply to the creek. However, the flows in the creek completely infiltrate in the Central Valley before discharging to any other surface water bodies. Thus, no downstream water bodies are directly affected by Corral Hollow Creek. The Basin Plan does specify general water quality objectives for all water bodies within the Sacramento and San Joaquin River Basins, and those objectives would apply to Corral Hollow Creek.

Off-Highway Motor Vehicle Recreation Act

The Off-Highway Motor Vehicle Recreation Act (OHMVR Act) (PRC Section 5090.01 et seq.) was adopted in 1982 and most recently updated in 2003. The OHMVR Act provides funds to State Parks' OHMVR Division for planning, acquiring, developing, operating, conserving, and maintaining OHV recreation. Per Section 5090.43, SVRAs are to be established on lands with quality recreational opportunities for OHVs, and developed, managed, and operated for the purpose of making the fullest public use of these opportunities. Development and operation of these lands must follow Section 5090.35 of the OHMVR Act, requiring the OHMVR Division to monitor wildlife and vegetation to determine whether habitat protection programs are being met, as well as to develop and implement soils conservation standards to minimize

adverse impacts caused by erosion. The OHMVR Division is also required to monitor and protect cultural and archeological resources within the SVRA and take appropriate measures to restore and repair any damage to such resources.

Storm Water Management Plan for Carnegie State Vehicular Recreation Area

The *Storm Water Management Plan for Carnegie SVRA* was prepared in 2012. State Parks also has two site-specific SWPPPs for the maintenance yard and the Tesla mine complex, due to higher risk of pollutant discharge in those areas. The purpose of the SWMP is to reduce pollutant discharges or eliminate them from the planning area by using site-specific structural and nonstructural BMPs to protect and improve water quality, while providing high-quality OHV recreational opportunities. The Carnegie SWMP is designed to meet the requirements set forth in SWRCB Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004, WDRs for Storm Water Discharges from Small MS4s, adopted on February 5, 2013. The SWMP used the findings from the *Corral Hollow Watershed Assessment* (State Parks 2007a) to develop recommendations for innovative BMPs to reduce erosion and sediment issues.

Elements of the Carnegie SVRA SWMP include public education and outreach, public involvement and participation, detection and elimination of illicit discharges, stormwater management at construction sites, postconstruction stormwater management, and pollution prevention/good housekeeping. Specifically, the SWMP includes implementation of a trails management plan; implementation, monitoring, and maintenance of projects associated with the OHMVR Division's *Soil Conservation Standard and Guidelines*; and the use of an OHV-specific BMP manual (State Parks 2007b) for selecting, implementing, and maintaining appropriate BMPs. The SWMP also includes an OHV element dedicated to discussing management goals and activities for maintaining OHV trails and facilities as they relate to meeting water quality objectives.

The SWMP also created a framework for active adaptive management, involving assessment of erosion and sediment-transport sources, use of BMPs, monitoring and evaluation, and implementation of long-term maintenance plans to ensure continued protection of water quality.

Off-Highway Motor Vehicle Recreation Division Soil Conservation Standard and Guidelines

The OHMVR Division updated its Soil Standard in 2008 in response to Assembly Bill (AB) 2666, and again in 2020 in response to SB 249. The Soil Standard and supporting guidelines are intended to ensure appropriate resource management and maintenance in areas of OHV use. The Soil Standard states that "Off-highway vehicle (OHV) recreation facilities shall be managed for sustainable long-term prescribed use without generating soil loss that exceeds restorability, and without causing erosion or sedimentation which significantly affects resource values beyond the facilities" (State Parks 2020c:5).

The guidelines in the Soil Standard provide tools and techniques that may be used to meet the 2020 standard. The guidelines were developed with input from representatives from State Parks' OHMVR Division, the California Department of Conservation/California Department of Forestry and Fire Protection, U.S. Bureau of Land Management, U.S. Forest Service, NRCS, and USGS. Through a series of public workshops, input was also obtained from representatives of approximately 30 other governmental organizations, OHV recreation groups, OHV industry consultants, and environmental communities.

The guidelines are broadly written to provide the flexibility needed to allow their application to all OHV sites statewide. Because the Soil Standard serves as resource management guidance for OHV use on prescribed trails and roads, on multiple-use roads, and in open-riding areas, each land manager is responsible for determining the recreational activity that may be causing any specific resource damage and initiate the appropriate action.

Regional and Local Regulations and Ordinances

Because Carnegie SVRA is owned by the State of California, it is not subject to compliance with San Joaquin or Alameda County policies or ordinances. However, it is State Park's intent to operate the SVRA

in a manner compatible with planning values expressed by the surrounding community; therefore, these policies and ordinances were considered as part of this environmental evaluation.

San Joaquin County General Plan

The relevant objectives and policies from the *San Joaquin County General Plan 2035* (San Joaquin County 2016) related to hydrology and water quality are to protect people and property from flood hazards (Public Health and Safety Element Goal PHS-2 and related policies) and ensure the quality of water for municipal and industrial uses, agriculture, recreation, and fish and wildlife (Natural and Cultural Resources Element Goal NCR-3 and related policies). Corral Hollow Creek is identified as a "substantial groundwater recharge area" in Figure VI-6 of the 2010 San Joaquin County General Plan. There is no direct reference to specific groundwater recharge areas in the 2035 General Plan.

Alameda County General Plan

The relevant goals, objectives, and policies from the *Alameda County General Plan* (Alameda County 1994d:I-88; 2014:46–48) related to hydrology and water quality are to:

- define areas of periodic flooding and reduce loss through sound land use planning, reduce man-caused stream and groundwater pollution and resource degeneration through cumulative impacts on surface and groundwater systems, maintain water resources in their highest quality, and control soil erosion caused by water through sound drainage system design and land use regulation (Conservation Element Objectives 3, 4, 5, and 7); and
- reduce hazards related to flooding and inundation (Safety Element Goal 3 and related policies).

East County Area Plan

The relevant goals and policies from the *East County Area Plan* (Alameda County 2002:67, 72, and 75) related to hydrology and water quality are to minimize the risks to lives and property due to flood hazards, protect and enhance surface and groundwater quality, and provide efficient, cost-effective, and environmentally sound storm drainage and flood control facilities, and to implement related policies.

2.7.3.3 Geology, Soils, Minerals, and Paleontological Resources Regulations

Federal Regulations and Laws

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the United States. To accomplish this goal, the act established the National Earthquake Hazards Reduction Program. The program's mission is to improve understanding, characterization, and prediction of hazards and vulnerabilities; improve building codes and land use practices; reduce risk through post-earthquake investigations and education; develop and improve design and construction techniques; improve mitigation capacity; and accelerate application of research results.

The National Earthquake Hazards Reduction Program was substantially amended in November 1990 by the National Earthquake Hazards Reduction Program Act, which refined the description of agency responsibilities, program goals, and objectives. This law designates FEMA as the program's lead agency and assigns several planning, coordinating, and reporting responsibilities. The National Earthquake Hazards Reduction Program was amended again in 2018 by the National Earthquake Hazards Reduction Program Reauthorization Act of 2018 to expand the activities of the Program. Other National Earthquake Hazards Reduction Program Act agencies are the National Institute of Standards and Technology, National Science Foundation, and USGS.

State Regulations and Laws

Off-Highway Motor Vehicle Act

The OHMVR Act (PRC Section 5090.35[c]) was adopted in 1988. The OHMVR Division is responsible for planning, acquiring, developing, operating, conserving, and maintaining lands in the SVRAs. Under this law, the OHMVR Division's staff is required to monitor wildlife and vegetation to determine whether habitat

protection protocols are being met. The OHMVR Act also requires the OHMVR Division to develop and implement soils standards to minimize the adverse impacts caused by erosion.

California Public Resources Code Section 5090.35

The PRC requires management and protection of soil resources specific to SVRAs. Section 5090.35(a) states:

> The protection of public safety, the appropriate utilization of lands, and the conservation of land resources are of the highest priority in the management of the state vehicular recreation areas; and, accordingly, the division shall promptly repair and continuously maintain areas and trails, anticipate and prevent accelerated and unnatural erosion, and restore lands damaged by erosion to the extent possible.

Off-Highway Motor Vehicle Recreation Division Soil Conservation Standard and Guidelines

See description in the "Hydrology and Water Quality" Regulations section above.

Best Management Practices Manual for Erosion and Sediment Control

The OHV BMP Manual (State Parks 2007b) provides guidance on selecting, implementing, and maintaining BMPs for OHV-type facilities and construction activities. BMPs detailed in the manual address erosion control (e.g., blankets, mulches, hydroseeding techniques), scour control (e.g., check dams and armoring as in upland swales and ditches), dust control, sediment traps, and waste management.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (PRC Sections 2621–2630) was enacted in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent buildings used for human occupancy from being constructed on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as "earthquake fault zones" around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require the completion of a geologic investigation demonstrating that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (PRC Sections 2690 through 2699.6) addresses earthquake hazards from nonsurface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, landslide, strong ground shaking, or other earthquake-related and geologic hazards. The act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce the hazards associated with seismicity and unstable soils.

Landslide Hazard Mapping Act

Following the 1982 El Niño storms in the San Francisco Bay area, the Landslide Hazard Mapping Act mandated the creation of new maps showing landslides and landslide hazards. Landslide hazard identification maps were prepared from 1986 to 1995 by the California Geological Survey for use by local government planners. A set of three to four maps was prepared for each map study area, usually encompassing a USGS 7.5-minute topographic quadrangle map. The set of maps typically consisted of a geologic map, a landslide inventory map (showing the location and distribution of existing landslides), and one or two maps showing relative susceptibility to landslides. The Landslide Hazard Identification Program has been repealed, but the maps produced under that program have been incorporated into the current California Seismic Hazards Program. Landslide inventory maps prepared for seismic hazards zonation are available as part of the California Geological Survey's Landslide Inventory Map Series.

California Building Standards Code

The California Building Standards Commission coordinates, manages, adopts, and approves building codes in California. The California Building Standards Code (CBC) (CCR Title 24) provides minimum standards for building design in California. The CBC applies to building design and construction in the state and is based on the federal Uniform Building Code used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with numerous more detailed or more stringent regulations. Where no other building codes apply, Chapter 29 of the CBC regulates excavation, foundations, and retaining walls.

The state earthquake protection law (California Health and Safety Code, Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. The CBC requires that any structure designed for a project site undergo a seismic-design evaluation that assigns the structure to one of six categories, A–F; Category F structures require the most earthquake-resistant design. The CBC philosophy focuses on "collapse prevention," meaning that structures are to be designed to prevent collapse during the maximum level of ground shaking that could reasonably be expected to occur at a site. CBC Chapter 16 specifies exactly how each seismic-design category is to be determined on a site-specific basis, based on site-specific soil characteristics and proximity to potential seismic hazards.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, as well as the preparation of a preliminary soil report, engineering geologic report, geotechnical report, and supplemental ground-response report. Chapter 18 also regulates the analysis of expansive soils and the determination of depth to the groundwater table. For structures in Seismic Design Category C, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading. For structures in Seismic Design Categories D, E, and F, Chapter 18 requires these same analyses plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and loss of soil strength, and lateral movement or reduction of the foundation's soil-bearing capacity.

Chapter 18 also requires that mitigation measures be considered in structural design. Mitigation measures may include stabilizing the ground, selecting appropriate foundation types and depths, selecting appropriate structural systems to accommodate anticipated displacements, or using any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak-ground-acceleration magnitudes and source characteristics consistent with the design earthquake ground motions. The peak ground acceleration must be determined in a site-specific study, the contents of which are specified in CBC Chapter 18.

Finally, Appendix J of the CBC regulates grading activities, including drainage and erosion control and construction on expansive soils, areas subject to liquefaction, and other unstable soils.

National Pollutant Discharge Elimination System and Storm Water Pollution Prevention Plans

As discussed in detail in the "Hydrology and Water Quality Regulations" section of this chapter, the SWRCB and Central Valley RWQCB have adopted specific NPDES permits for activities that have the potential to discharge wastes (including sediment) to waters of the state. The SWRCB's statewide stormwater general permit for construction activity (Order WQ 2022-0057-DWQ) is applicable to all land-disturbing construction activities that would disturb 1 acre or more. Compliance with the NPDES permit requires the discharger to submit a notice of intent to discharge to the Central Valley RWQCB and implement a SWPPP that includes BMPs to minimize water quality degradation during construction activities.

California Public Resources Code Section 5097.5

Unauthorized collection of fossils on land under state ownership or jurisdiction is considered a misdemeanor, punishable by fine and/or imprisonment. PRC Section 5097.5 states:

> A person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate

paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

Local Regulations and Ordinances

Because Carnegie SVRA is owned by the State of California, it is not subject to compliance with San Joaquin or Alameda County policies or ordinances. However, it is the intent of State Parks to operate the SVRA in a manner compatible with planning values expressed by the surrounding community; therefore, these policies and ordinances were considered as part of this environmental evaluation.

San Joaquin County General Plan

The relevant objectives and policies from the *San Joaquin County General Plan 2035* (San Joaquin County 2016:3.3-10) related to geology, soils, minerals, and paleontological resources are to reduce the risk to life and property from potential seismic and geologic hazards (Public Health and Safety Element Goal PHS-2 related policy); and to protect San Joaquin County's valuable architectural, historical, archaeological, and cultural resources (Natural and Cultural Resources Element Goal NCR-6 and related policy).

Alameda County General Plan

The relevant goal and policies from the *Alameda County General Plan* (Alameda County 2014:16–18) related to geology, soils, minerals, and paleontological resources are to minimize risks to lives and property due to seismic and geologic hazards and implement related policies.

East County Area Plan

The relevant goal and policies of the *East County Area Plan* (Alameda County 2002:36) related to geology, soils, minerals, and paleontological resources are to protect cultural resources from development and implement related policies.

2.7.3.4 Air Quality Regulations

The Planning Area lies within both Alameda County in the SFBAAB and San Joaquin County in the SJVAB. Therefore, the U.S. Environmental Protection Agency (EPA), ARB, and both BAAQMD and SJVAPCD are responsible for regulating air quality in the vicinity of the Planning Area. Each agency develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, in general, both state and local regulations may be more stringent. The regulatory frameworks for criteria air pollutants, toxic air contaminants (TACs), and other emissions are described below.

Federal Regulations and Laws

EPA is charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal CAA. Enacted in 1970, the CAA required EPA to establish primary and secondary national ambient air quality standards. The CAA also required each state to prepare an air quality control plan, referred to as a SIP.

The U.S. Congress's most recent major amendments to the CAA were made in 1990. The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins, as reported by their jurisdictional agencies. EPA reviews all SIPs to determine whether they conform to the mandates of the CAAA and whether implementing them will achieve air quality goals.

Air quality regulations also focus on hazardous air pollutants (HAPs), referred to at the state level as TACs. HAPs can be separated into carcinogens (cancer-causing) and non-carcinogens, based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are

assumed to have no safe threshold below which health impacts would not occur. Non-carcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. EPA regulates HAPs through statutes and regulations that generally require the use of the maximum or best available control technology (MACT or BACT) for toxics to limit emissions.

The CAA requires EPA to identify and set national emissions standards for HAPs to protect public health and welfare. Emissions standards are set for what are called "major sources" and "area sources."[1] The CAA also requires EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions of, at a minimum, benzene and formaldehyde. Performance criteria are established to limit mobile-source emissions of toxics.

State Plans, Regulations and Laws

ARB coordinates and oversees state and local air pollution control programs in California and implements the California Clean Air Act (CCAA).

Criteria Air Pollutants

Adopted in 1988, the CCAA required ARB to establish the California ambient air quality standards (CAAQS). In most cases, the CAAQS are more stringent than the national ambient air quality standards (NAAQS). Differences in the standards are generally explained by the health-effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in California endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources and provides districts with the authority to regulate indirect sources. ARB also maintains air quality monitoring stations throughout the state in conjunction with air districts. ARB uses the data collected at these stations to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

ARB is the lead agency for developing the SIPs in California. SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. Local air districts and other agencies prepare SIP elements and submit them to ARB for review and approval. ARB forwards SIP revisions to the EPA for approval and publication in the Federal Register. Most recently, in September 2022, ARB adopted the *2022 State Strategy for the State Implementation Plan* (State SIP Strategy), describing the proposed commitment to achieve the reductions necessary from mobile sources, fuels, and consumer products to meet federal ozone and $PM_{2.5}$ standards over the next 15 years (ARB 2022a).

Among ARB's other responsibilities are overseeing local air districts' compliance with California and federal laws, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

ARB has established emission standards for vehicles sold in California and for various types of equipment. California gasoline specifications are governed by both state and federal agencies, which have imposed numerous requirements on the production and sale of gasoline in California during the past 30 years. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA earlier that year. The standards

[1] Major sources have the potential to emit more than 10 tons per year of any HAP or more than 25 tons per year of any combination of HAPs; all other sources are considered area sources. There are two types of emissions standards: those that require application of MACT and BACT, and those that are health-risk based and deemed necessary to address the risks that remain after implementation of MACT or BACT. For area sources, the MACT or BACT standards may be different because of differences in generally available control technology.

required engine manufacturers to meet after-treatment–based exhaust standards for nitrogen oxides (NO_X) and PM, starting in 2011, that were more than 90 percent lower than then-current levels, putting emissions from off-road engines virtually on par with those from on-road, heavy-duty diesel engines. ARB has also adopted control measures for DPM and more stringent emissions standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

In 2017, Senate Bill (SB) 1 (the Road Repair and Accountability Act of 2017) was passed, which, in addition to funding transportation-related projects, requires the Department of Motor Vehicles to refuse registration or renewal or transfer of registration for certain diesel-fueled vehicles, based on weight and model year, that are subject to specified provisions relating to the reduction of emissions of diesel particulate matter, oxides of nitrogen, and other criteria pollutants from in-use diesel-fueled vehicles. As of January 1, 2020, compliance with the ARB Truck and Bus regulation is now automatically verified by the California DMV as part of the vehicle registration process.

In June 2020, ARB approved the Advanced Clean Trucks regulation, requiring truck manufacturers to transition from diesel-powered trucks and vans to electric zero-emission trucks beginning in 2024 with phasing in of increasingly stringent requirements through 2045. By 2045, under the Advanced Clean Trucks regulation, every new truck sold in California will be zero-emission.

Similarly, in June 2022, in support of Executive Order N-79-20, ARB proposed the Advanced Clean Cars II Regulations requiring manufacturers of light-duty passenger cars, trucks and sport utility vehicles (SUVs) to transition to electric zero-emission vehicles beginning with model year 2026 and phasing in of increasingly stringent requirements through 2035. By 2035, under the proposed Advanced Clean Cars II Regulations, all new passenger vehicles sold within the state would be zero emissions.

ARB's Enforcement Program is responsible for preventing the illegal sale and use of nonconforming or non–California certified vehicles, engines, and emissions-related parts in California.

Regulations for California OHVs control emissions from mobile sources (including evaporative emissions) by ensuring that all OHVs operating in California meet emissions standards. In January 1994, ARB adopted emission-control regulations for dirt bikes and ATVs requiring that all dirt bikes and ATVs sold in California, model year 1998 and later, be certified by ARB's On-Road Light-Duty Certification Section. In 1998, ARB revised the OHV regulations to allow noncompliant dirt bikes and ATVs not meeting the new emission standards to be used during certain periods of the year—mainly fall, winter, and spring months when ozone levels are low. These noncompliant vehicles are issued a red registration sticker from the California Department of Motor Vehicles. Certified compliant vehicles and all model-year-2002 and newer OHVs are issued a green registration sticker, which allows these vehicles to be operated in any designated use area at any time during the year.

ARB approved evaporative emission standards for OHVs that went into effect in 2008. These standards allowed changes to the use seasons for OHVs with red sticker registration, based on new air basin data. They also added three vehicle types subject to OHV regulations: off-road utility vehicles, off-road sport vehicles, and sand cars (e.g., dune buggies, sand rails). In 2013, ARB developed regulations limiting the amount of evaporative emissions which are permitted by each OHV.

Regulatory amendments were made in 2019, effective January 1, 2020, to end this Red Sticker program. Certification of new red sticker vehicles ended in 2022. In addition, California established new exhaust and evaporative emissions standards for OHVs starting in 2020 which will transition the state requirements to align with federal standards.

Toxic Air Contaminants

As described under the federal regulations above, ARB regulates TACs, of which a subset of the identified substances are the federally identified and regulated HAPs, through statutes and regulations that generally require the use of MACT and BACT.

TACs in California are regulated primarily through the Tanner Air Toxics Act (Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act (AB 2588; Chapter 1252, Statutes of 1987). The Air Toxics Hot Spots Information and Assessment Act seeks to identify and evaluate risks from air toxics sources but does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities must perform a health risk assessment and, if specific thresholds are violated, must communicate the results to the public in the form of notices and public meetings. TACs are generally regulated through statutes and rules that require the use of MACT or BACT to limit TAC emissions.

According to the *California Almanac of Emissions and Air Quality* (ARB 2013), most of the estimated health risk from TACs is attributed to relatively few compounds, the most dominant being diesel particulate matter (DPM). In 2000, ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled vehicles and engines.[2]

The State of California has also implemented regulations to reduce DPM emissions. Two such regulations applicable to the proposed project include Title 13, Sections 2485 and 2449 of the California Code of Regulations, which limit idling time to a maximum of 5 minutes for heavy-duty commercial diesel vehicles (defined as diesel vehicles heavier than 10,000 pounds gross vehicle rated weight) and off-road diesel-fueled construction vehicles, respectively. These regulatory measures are driven by the ARB Airborne Toxic Control Measure and subsequent amendments.

Regional Plans, Regulations and Ordinances

Although State Parks is not generally subject to regional or local land use plans and regulations, it is subject to plans and regulations implementing delegated federal authority. The following describes the local air district policies and regulations used to develop the impact analyses for this resource.

Criteria Air Pollutants

Bay Area Air Quality Management District

BAAQMD attains and maintains air quality conditions in the SFBAAB, which includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, along with southwestern Solano County and southern Sonoma County. BAAQMD's clean-air strategy involves preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations for air pollution generators, and issuing permits for stationary sources of air pollution. BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and CCAA.

The most recent CEQA Air Quality Guidelines were published in April 2022 to assist lead agencies in evaluating air quality and climate impacts from proposed land use projects and plans in the SFBAAB (BAAQMD 2022). The Guidelines include nonbinding recommendations for how a lead agency can evaluate, measure, and mitigate air quality and climate impacts generated from land use construction and operational activities. The Guidelines do not replace the State CEQA Statute and Guidelines; rather, they are designed to provide Air District-recommended procedures for evaluating potential air quality and climate impacts during the environmental review process that are consistent with CEQA requirements. This advisory document provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents.

BAAQMD Air Quality Plans

The CCAA requires air quality management/air pollution control districts to assess, once every 3 years, the extent of air quality improvements and emissions reductions that they have achieved by using control measures. During this triennial assessment, the districts must review their air quality attainment plans and revise them if necessary to correct deficiencies in progress and incorporate new data or projections.

[2] Additional regulations apply to new trucks and diesel fuel. Subsequent ARB regulations on diesel emissions include the On-Road Heavy Duty Diesel Vehicle (In Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-road Diesel Vehicle Regulation, and the New Off-road Compression Ignition Diesel Engines and Equipment Program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel-powered equipment.

BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB in coordination with the MTC and ABAG. Among these plans are ozone attainment plans for the national ozone standard and clean-air plans for the California standard.

On April 19, 2017, the BAAQMD Board of Directors adopted the 2017 Clean Air Plan (BAAQMD 2017) which describes a comprehensive control strategy that the Air District will implement to reduce emissions of particulate matter, TACs, ozone precursors, and greenhouse gases to protect public health and the climate. Consistent with the GHG reduction targets adopted by the state of California, the Plan lays the groundwork for a long-term effort to reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. To fulfil state ozone planning requirements, the 2017 control strategy includes all feasible measures to reduce emissions of ozone precursors—reactive organic gases (ROG) and nitrogen oxides (NOx)—and reduce transport of ozone and its precursors to neighboring air basins. In addition, the Plan builds upon and enhances the Air District's efforts to reduce emissions of fine particulate matter and TACs. The control strategy also serves as a regional climate protection strategy by reducing emissions of greenhouse gases across the full range of economic sectors.

BAAQMD Rules and Regulations

BAAQMD is responsible for monitoring air pollution and developing and administering programs to reduce air pollution levels throughout the SFBAAB. Specific rules and regulations limit the emissions that various uses and activities can generate and identify specific pollution reduction measures that must be implemented. These rules regulate the emissions of not only criteria pollutants, but also TACs. The rules are also subject to ongoing refinement by BAAQMD.

All projects within BAAQMD's jurisdictional area are subject to BAAQMD rules and regulations. Specific BAAQMD rules that could be applicable include but are not limited to the following:

- *Regulation 2, Rule 1:* Permits – General Requirements
- *Regulation 6, Rule 1:* Particulate Matter – General Requirements
- *Regulation 6, Rule 6:* Particulate Matter – Prohibition of Trackout
- *Regulation 7:* Odorous Substances
- *Regulation 8, Rule 15*: Emulsified and Liquid Asphalt
- *Regulation 11, Rule 2:* Asbestos, Demolition, Renovation and Manufacturing

San Joaquin Valley Air Pollution Control District

SJVAPCD seeks to improve air quality conditions in San Joaquin County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. SJVAPCD's clean-air strategy is similar to BAAQMD's strategy, described above.

In March 2015, SJVAPCD released a revision to its previously adopted guidelines document. This revised *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI; SJVAPCD 2015) is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The guide contains the following applicable components:

- criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- methods available to mitigate air quality impacts; and
- information for use in air quality assessments that will be updated more frequently, such as air quality data, regulatory setting, climate, and topography.

SJVAPCD Air Quality Plans

SJVAPCD prepares air quality attainment plans and submits them to ARB in compliance with the CCAA's requirements. The 2007 Ozone Plan for 8-hour ozone, adopted in April 2007, includes a comprehensive

list of regulatory and incentive-based measures to reduce emissions of ozone and PM precursors throughout the SJVAB. Additionally, this plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution, and an increase in state and federal funding for incentive-based measures to create adequate reductions in emissions to bring the entire air basin into attainment with the 1997 federal 8-hour ozone standard. The *2016 Plan for the 2008 8-Hour Ozone Standard* was adopted by SJVAPCD in June 2016 to address attainment of the 2008 national 75 parts per billion 8-hour ozone standard. Most recently, the *2022 Plan for the 2015 8-Hour Ozone Standard* was adopted by SJVAPCD in December 2022. The plan was prepared to enable the district to expeditiously attain the 2015 national 70 parts per billion 8-hour ozone standard. The plan contains an exhaustive list of regulatory and incentive-based measures to reduce emissions of ozone precursors in the region. Because mobile sources are a dominant source of ozone precursors in the region, strong participation and cooperation between local, state, and federal agencies has been necessary to achieve the goals of the 2022 Plan. Based on future technology and full implementation of the proposed control measures, the plan estimates that NOx emissions will be reduced by 72% between 2018 and 2037 (SJVAPCD 2022). For the revoked national 1-hour ozone standard of 124 parts per billion, SJVAPCD adopted the *2023 Maintenance Plan and Redesignation Request* on June 15, 2023.

In November 2018, SJVAPCD adopted its *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$* Standards, which replaces the *2008 $PM_{2.5}$ Plan.* The U.S. EPA has approved portions of this Plan, and the SJVAPCD continues to work with CARB and EPA to receive full approval of the remaining Plan elements. This plan addresses the EPA federal 1997 annual $PM_{2.5}$ standard of 15 micrograms per cubic meter and 24-hour $PM_{2.5}$ standard of 65 micrograms per cubic meter; the 2006 24-hour $PM_{2.5}$ standard of 35 micrograms per cubic meter; and the 2012 annual $PM_{2.5}$ standard of 12 micrograms per cubic meter. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable. Like the 2008 plan, the 2018 plan benefits from emissions reduction measures and programs already in place in current ozone and PM_{10} plans, because reduction measures to minimize ozone and PM_{10} precursors and emission sources also reduce $PM_{2.5}$ emissions. In addition to developing a framework to reduce $PM_{2.5}$ emissions, the plan targets emissions of NO_X, which is a precursor to $PM_{2.5}$ and ozone. The Valley was on track to meet this standard by the projected attainment target of 2020, but significant wildfire impacts and data collection issues at the air monitoring site in Bakersfield delayed this. On August 19, 2021, the Valley Air District's Governing Board approved the *Attainment Plan Revision for the 1997 Annual $PM_{2.5}$ Standard* to establish a new attainment target date for the 1997 annual $PM_{2.5}$ standard. Based on implementation of the control strategy in the *2018 $PM_{2.5}$ Plan*, modeling has shown that the Valley will attain the 1997 annual $PM_{2.5}$ standard by the new attainment date of 2023, if not earlier[3]. The District was reclassified to serious nonattainment for the 2012 $PM_{2.5}$ standard in December 2021, and SJVAPCD is currently developing an updated plan to address this reclassification, which is due to EPA by the end of 2023.

SJVAPCD Rules and Regulations

Like BAAQMD, SJVAPCD adopts rules and regulations to limit the generation of emissions from a range of sources and activities. All projects are subject to SJVAPCD rules and regulations in effect at the time of construction. The following specific rules are potentially relevant to the proposed planning of Carnegie SVRA:

- *Regulation III, Rule 3135*: Dust Control Plan Fee
- *Regulation IV, Rule 4101*: Visible Emissions
- *Regulation IV, Rule 4102*: Nuisance
- *Regulation IV, Rule 4601*: Architectural Coatings
- *Regulation IV, Rule 4641*: Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations
- *Regulation VIII:* Fugitive PM_{10} Prohibitions, including the following rules:
  - *Rule 8011*—General Requirements

[3] https://ww2.valleyair.org/rules-and-planning/air-quality-plans/particulate-matter-plans/2018-pm-25-plan-for-the-san-joaquin-valley/

  - *Rule 8021*—Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities
  - *Rule 8041*—Carryout and Trackout (of dirt and other materials onto paved public roads)
  - *Rule 8051*—Open Areas
  - *Rule 8061*—Paved and Unpaved Roads (construction and use)
  - *Rule 8071*—Unpaved Vehicle/Equipment Traffic Areas
- *Regulation IV: Rule 9110*: General Conformity
- *Regulation IV: Rule 9510:* Indirect Source Review (ISR)

Rules 8011–8081 are designed to reduce PM_{10} emissions (predominantly dust and dirt) generated by human activity, namely construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, and landfill operations. If a nonresidential project is 5.0 or more acres in area, a dust control plan must be submitted as specified in Section 6.3.1 of Rule 8021. Construction activities may not commence until SJVAPCD has approved the dust control plan.

Rule 9510 was adopted to reduce the impacts of growth in emissions from all new development in the SJVAB. The purposes of Rule 9510 are:

- Fulfill SJVAPCD's emission reduction commitments in the PM_{10} and ozone attainment plans.
- Achieve emission reductions from the construction and use of development projects through design features and on-site measures.
- Provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures.

Rule 9510 requires applicants subject to the rule to provide information that enables SJVAPCD to quantify construction-related and operational NO_X and PM_{10} exhaust emissions. The Rule also requires for applicable projects that construction exhaust emissions from equipment greater than 50 horsepower be reduced by 20 percent for NO_X and 45 percent for PM_{10} when compared to the statewide fleet average. For operations, NO_X emissions must be reduced by 33.3 percent and exhaust PM_{10} emissions must be reduced by 50 percent; the operational emissions reductions may occur over a period of 10 years. Reductions in both construction-related and operational emissions may be achieved by implementing on-site measures or paying an off-site fee, or through a combination of both methods. However, if the initial emissions calculation shows that emissions would be less than 2 tons per year of NO_X or exhaust PM_{10}, the project is exempt from the requirement to pay an off-site emission reduction fee, but not from potential mitigation measures.

On-site measures to mitigate construction emissions may include using cleaner fuels, retrofitting equipment on engines and exhaust systems, and using new, low-emissions engine types. Measures to reduce operational emissions include designing buildings for energy efficiency and implementing site designs and procedures to reduce trip generation.

Toxic Air Contaminants

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Both air districts limit emissions and public exposure to TACs through a number of programs and prioritize TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Bay Area Air Quality Management District

Under BAAQMD Rule 2-1 (Permits—General Requirements), Rule 2-2 (New Source Review), and Rule 2-5 (New Source Review of Toxic Air Contaminants), all sources that have the potential to emit TACs must obtain permits from BAAQMD. BAAQMD analyzes sources that require a permit (e.g., by performing health risk assessments) based on their potential to emit TACs. If BAAQMD determines that project-related emissions would exceed its threshold of significance for TACs, the source must implement the best available control technology for TACs (T-BACT) to reduce emissions. Residential, retail, and

commercial uses typically do not require T-BACT measures because the TACs generated by these uses would be nominal. If a source cannot reduce the risk below the threshold of significance even after implementing T-BACT, BAAQMD will deny the permit. This helps to prevent new problem emissions sources and reduces emissions from existing sources by requiring them to apply new technology when retrofitting.

BAAQMD's air quality permitting process applies to stationary sources. Properties that are exposed to elevated levels of TACs from nonstationary sources, and the nonstationary sources themselves (e.g., on-road vehicles), are not subject to air quality permits. Further, for reasons of feasibility and practicality, mobile sources (e.g., cars, trucks) are not required to implement T-BACT even if they have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on mobile sources are subject to regulations implemented at the federal and state levels by EPA and ARB, respectively. San Joaquin Valley Air Pollution Control District

San Joaquin Valley Air Pollution Control District
Under SJVAPCD Regulation IV, Rule 4002 (National Emissions Standards for Hazardous Air Pollutants), and Regulation VII (Toxic Air Pollutants), all sources that possess the potential to emit TACs must obtain permits from the district. SJVAPCD may grant permits to these operations if they are constructed and operated in accordance with applicable regulations, including new-source review standards and air toxics control measures. SJVAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. It requires a comprehensive health risk assessment for facilities that are put in the "significant risk" category under the AB 2588 program (the Hot Spots Act).

Sources that require a permit are analyzed by SJVAPCD (e.g., by performing health risk assessments) based on their potential to emit toxics. If SJVAPCD determines that project-related emissions would exceed its threshold of significance for TACs, the source must implement T-BACT to reduce emissions. If a source cannot reduce the risk below the threshold of significance, even after T-BACT has been implemented, SJVAPCD will deny the permit. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs.

Like BAAQMD's permitting process, SJVAPCD's air quality permitting process applies to stationary sources. Properties exposed to elevated levels of TACs from nonstationary type sources, and the nonstationary type sources themselves, are not subject to air quality permits. Further, mobile sources are not required to implement BACT. Rather, emissions controls on such sources are subject to federal and state regulations.

Odor Regulations

There are no federal or state regulations related to odors. Odors are typically considered a local air quality problem.

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments, BAAQMD, and SJVAPCD. BAAQMD's Regulation 7 (Odorous Substances) and SJVAPCD's Rule 4102 (Nuisance) place general limitations on odorous substances and nuisances to limit the generation of odors within the SFBAAB and SJVAB, respectively.

2.7.3.5 Greenhouse Gas Emissions and Energy Regulations

Federal Regulations and Laws

EPA is the federal agency responsible for implementing the federal CAA. The U.S. Supreme Court ruled on April 2, 2007, that CO_2 is an air pollutant as defined in the CAA, and that EPA has the authority to regulate emissions of GHGs. In *Massachusetts v. Environmental Protection Agency et al.,* 12 states and cities (including California) along with several environmental organizations sued to require EPA to regulate GHGs as pollutants under the CAA (127 S. Ct. 1438 [2007]). The Supreme Court ruled that

GHGs fit within the CAA's definition of a pollutant and that EPA had the authority to regulate GHGs. The Inflation Reduction Act, signed on August 16, 2022, affirms EPA's authority to regulate greenhouse gas emissions under the CAA.

Energy Independence and Security Act of 2007, Corporate Average Fuel Economy Standards and Safer Affordable Fuel-Efficient Standards

The Energy Independence and Security Act of 2007 (EISA) amended the Energy Policy and Conservation Act to further reduce fuel consumption and expand production of renewable fuels. The EISA's amendment statutorily mandated that the National Highway Traffic Safety Administration (NHTSA) set light duty cars and trucks average fuel economy (CAFE) standards for each model year.

The first phase targeted vehicle model years 2012–2016, while the second phase of the standards includes GHG and fuel economy standards for model years 2017–2025. On May 2, 2022, finalized 2024-2026 model year standards were published, which require the fuel economy standards to increase eight percent year over year for model years 2024 and 2025 and 10 percent annually for model year 2026. In 2026, if all standards are met through fuel efficiency improvements, the average industry fleetwide fuel efficiency for light duty cars and trucks would be approximately 49 miles per gallon (NHTSA 2022). The 2024-2026 standards are anticipated to save approximately 200 billion gallons of oil and 2.5 billion metric tons of GHG emissions.

In addition to standards for light duty cars and trucks, EPA and NHTSA are also implementing the Medium- and Heavy-Duty Vehicle GHG Emissions and Fuel Efficiency Standards These standards include phased requirements for GHG reduction and fuel efficiency in medium- and heavy-duty vehicles and are also anticipated to generate development and research jobs focused on advanced cost-effective technologies for cleaner and more efficient commercial vehicles.

Renewable Fuel Standard Program

The Energy Policy Act of 2005, which amended the CAA, created the 2005 Renewable Fuel Standard Program (RFS) to reduce the reliance on fossil fuels. The RFS established requirements for volumes of renewable fuel used to replace petroleum-based fuels. The four renewable fuels accepted as part of RFS are biomass-based diesel, cellulosic biofuel, advanced biofuel, and total renewable fuel. The 2007 Energy Independence and Security Act expanded the program and its requirements to include long-term goals of using 36 billion gallons of renewable fuels and extending annual renewable fuel volume requirements to year 2022 and requires EPA to set renewable fuel volumes for 2023 and beyond in coordination with the Secretary of Energy and according to certain criteria defined in the statute. The four renewable fuels have specific renewable fuel-blending requirements for obligated parties, such as refiners and importers of gasoline or diesel fuel. EPA implements the program in consultation with U.S. Departments of Agriculture and Energy. Gasoline and diesel refiners and importers (Obligated Parties) are required to demonstrate compliance with the Renewable Fuel Standard program.

State Plans, Policies, Regulations, and Laws

The legal framework for GHG emission reductions has come about through Executive Orders, legislation, and regulations. The major components of California's climate change initiatives are outlined below.

Greenhouse Gas Reduction Targets

Executive Order S-3-05

Executive Order (EO) S-3-05 issued in 2005 in recognition of California's vulnerability to the effects of climate change, set forth the following target dates by which statewide GHG emissions would be progressively reduced:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020, reduce GHG emissions to 1990 levels; and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions below 1990 levels by 2020. AB 32 also identifies the ARB as the State *agency* responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

Executive Order B-30-15

Signed in 2015, EO B-30-15 establishes a statewide GHG emissions reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and the EO S-3-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the executive order aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014. EO B-30-15 also requires all state agencies with jurisdiction over sources of greenhouse gas emissions to implement measures within their statutory authority for achieving reductions in greenhouse gas emissions and meeting the 2030 and 2050 greenhouse gas emission reduction targets.

Senate Bill 32

On August 24, 2016, the California Legislature passed SB 32 (California Health and Safety Code division 25.5, section 38566) thereby amending the California Global Warming Solutions Act of 2006. SB 32 directed ARB to adopt, to the extent technologically feasible and cost effective, the rules and regulations necessary to achieve a reduction in statewide greenhouse gas emissions (i.e., to 40 percent below 1990 levels by 2030). The passage of SB 32 codified the 2030 interim greenhouse gas emissions reduction target established by Executive Order B-30-15.

The companion bill to SB 32, AB 197, provides additional guidance on how to achieve the reduction targets established in EO B3015 and SB 32. AB 197 requires additional annual reporting of emissions and requires Scoping Plan updates to include alternative compliance mechanisms for each statewide reduction measure, along with market-based compliance mechanisms and potential incentives.

Executive Order B-55-18

For the post-2030 period, EO B-55-18 establishes a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. The EO states that this new goal is in addition to the existing statewide targets of reduced GHG emissions.

Assembly Bill 1279

Signed September 16, 2022, AB 1279, the California Climate Crisis Act, codified EO B-55-18. This bill declares the policy of the state both to achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and achieve and maintain net negative greenhouse gas emissions thereafter. It as requires that by 2045 statewide anthropogenic greenhouse gas emissions are reduced to at least 85 percent below the 1990 levels.

State Climate Change Scoping Plan

In December 2008, ARB adopted the Climate Change Scoping Plan (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (ARB 2008). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of California's GHG inventory. ARB acknowledges that land use planning decisions will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. The Scoping Plan details the regulations, alternative compliance mechanisms, voluntary actions and incentives, etc. proposed to meet the target emission reduction levels.

ARB is required to update the Scoping Plan at least once every five years to evaluate progress and develop future inventories that may guide this process. ARB approved the first update to the Climate Change Scoping Plan: Building on the Framework in June 2014 (ARB 2014). The Scoping Plan Update

included a status of the 2008 Scoping Plan measures and other federal, State, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020. The Scoping Plan Update determined that the State was on schedule to achieve the 2020 target (i.e., 1990 levels by 2020). The statewide measures adopted under the direction of AB 32, and as outlined in the Scoping Plan, would reduce GHG emissions associated with existing development, as well as new development.

ARB released the 2030 Target Scoping Plan Update Concept Paper to initiate a discussion regarding how to most effectively achieve a 40 percent reduction in GHG emissions by 2030 as compared to 1990 statewide GHG emissions (consistent with SB 32) (ARB 2016). This Concept Paper was followed by the release of the 2017 Scoping Plan Update: *California's 2017 Climate Change Scoping Plan*, which establishes a proposed framework of action for California to reduce statewide emissions by 40 percent by 2030 compared to 1990 levels (ARB 2017). The plan also highlights California's progress toward meeting the 2030 greenhouse gas emissions reduction goals of SB 32 and evaluates how to align the state's longer-term greenhouse gas reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use. The 2017 climate change scoping plan estimates 385 million MT of CO_2e would be reduced from known commitments, leaving a gap of 236 million MT CO_2e that is needed to meet the 2030 target codified by SB 32. ARB concluded that the gap in emissions would need to be bridged by the cap-and-trade program's achievement of 236 million MT CO_2e.

ARB has now released the final 2022 Scoping Plan Update, which evaluates progress toward the 2030 target, as well as examining scenarios that could achieve carbon neutrality by 2045 or sooner (ARB 2022b). The 2022 Scoping Plan Update focuses on actions needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives.

Executive Order N-19-19

EO N-19-19 directs the Department of Finance to create a Climate Investment Framework that shifts investments into sectors that have more growth potential as a result of their focus on carbon reduction and climate resiliency. This Executive Order also directs the State Transportation Agency to align transportation spending with the State's Climate Change Scoping Plan, including directing investments to support housing production near available jobs and directs the California Air Resources Board to take actions that would encourage manufacturers to produce clean vehicles, increase demand for electric vehicles, and achieve needed reductions from the transportation sector.

Transportation Sector Regulations to Reduce Greenhouse Gas Emissions

Executive Order B-16-12

Executive Order B-16-12 orders State entities under the direction of the Governor including ARB, the Energy Commission, and Public Utilities Commission to support the rapid commercialization of zero emission vehicles (ZEV). It directs these entities to achieve various benchmarks related to zero emission vehicles, including:

- Infrastructure to support up to one million zero emission vehicles by 2020;
- Widespread use of zero emission vehicles for public transportation and freight transport by 2020;
- Over 1.5 million zero emission vehicles on California roads by 2025;
- Annual displacement of at least 1.5 billion gallons of petroleum fuels by 2025; and
- A reduction of GHG emissions from the transportation sector equaling 80 percent below 1990 levels by 2050.

Executive Order S-01-07 (Low Carbon Fuel Standard)

EO S-01-07 (17 CCR 95480 et seq.) requires the State to achieve a 10 percent or greater reduction by 2020 in the average fuel carbon intensity for transportation fuels in California regulated by ARB. ARB identified the Low Carbon Fuel Standard (LCFS) as a discrete early action item under AB 32, and the final

ARB resolution (No. 09-31) adopting the LCFS was issued on April 23, 2009. ARB re-adopted LCFS in 2015. The LCFS was amended in 2018 to further reduce the carbon intensity to 20 percent or greater by 2030 to align with the 2030 GHG reduction target enacted through SB 32.

Executive Order N-79-20

Signed September 23, 2020, EO N-79-20 sets the goal to transition to 100 percent ZEVs for in-state sales of new passenger cars and trucks by 2035 and for medium-and heavy-duty vehicles by 2045. In addition, EO N-79-20 sets the goal for California to transition to 100 percent zero-emission off-road vehicles and equipment by 2035.

ARB Advanced Clean Cars Program/Zero Emission Vehicle Program

AB 1493 (Chapter 200, Statutes of 2002), also known as the Pavley regulations, required ARB to adopt regulations by January 1, 2005, that would result in the achievement of the "maximum feasible" reduction in GHG emissions from vehicles used in the state primarily for non-commercial, personal transportation.

In January 2012, ARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards called Advanced Clean Cars (13 CCR 1962.1 and 1962.2). The Advanced Clean Cars requirements include GHG standards for model year 2017 to 2025 vehicles.

The Advanced Clean Cars Program also includes the Low Emission Vehicle (LEV) III amendments to the LEV regulations (13 CCR 1900 et seq.); ZEV Program and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of the very cleanest cars available. These zero-emission vehicles, which include battery electric, fuel cell, and plug-in hybrid electric vehicles, have now entered the marketplace. The Clean Fuels Outlet regulation ensures that fuels, such as electricity and hydrogen, are available to meet the needs of the new advanced technology vehicles as they come to market. ARB projects that the LEV III standards will reduce motor vehicle GHG emissions by 04 percent in 2025 (ARB 2022b). In June 2022, in support of EO N-79-20, ARB proposed the Advanced Clean Cars II Regulations requiring manufacturers of light-duty passenger cars, trucks, and SUVs to transition to electric zero-emission vehicles beginning with model year 2026 and phasing in of increasingly stringent requirements through 2035. By 2035, under the proposed Advanced Clean Cars II Regulations, all new passenger vehicles sold within the state would be zero emission.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB adopted regional GHG targets for passenger vehicles and light trucks for 2020 and 2035 for the 18 MPOs in California. If the combination of measures in the SCS would not meet the regional targets, the MPO must prepare a separate "alternative planning strategy" to meet the targets.

Energy Sector Regulations to Reduce Greenhouse Gas Emissions

California Energy Commission

The California Energy Commission (CEC) was created in 1974 and is the state's primary energy policy and planning agency to regulate energy efficiency standards. The CEC is tasked with reducing energy costs and environmental impacts of energy use - such as greenhouse gas emissions - while ensuring a safe, resilient, and reliable supply of energy. Among other work, the CEC collects and analyzes energy-related data, including energy production, transportation, delivery, and distribution, in order to provide both historical and forecast data on energy usage. It also develops energy policy recommendations and plans for the state and is in charge of energy efficiency programs and the enforcement of appliance and building energy efficiency standards.

SB 1389 requires the CEC to prepare a biennial integrated energy report. In accordance, the CEC prepares the Integrated Energy Policy Report, which provides a cohesive approach to identifying and address the state's energy requirements and challenges. The report develops and lays the framework for implementation of energy plans and policies. The report contains an integrated assessment of major energy trends and issues facing California's electricity, natural gas, and transportation fuel sectors. The report provides policy recommendations to conserve resources, protect the environment, ensure reliable, secure, and diverse energy supplies, enhance the state's economy, and protect public health and safety.

Senate Bill 1078 (2002), Senate Bill 100 (2018) – California Renewable Portfolio Standard
Established in 2002 by SB 1078, California's Renewables Portfolio Standard (RPS) requires electricity providers (i.e., utilities, cooperatives, and community choice aggregators) to provide a specified minimum portion of their electricity supply from eligible renewable resources by milestone target years. Since 2002, state legislative actions have modified and accelerated the RPS several times, resulting in one of the most ambitious renewable energy standards in the country. Per SB 100, the RPS requires retail sellers of electricity to serve 60 percent of their electric load with renewable energy by 2030 with new interim targets of 44 percent by 2024 and 52 percent by 2027, as well as requiring that all of the state's electricity come from carbon-free resources (not only RPS-eligible ones) by 2045.

California Code of Regulations Title 20: Appliance Efficiency Regulations
California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California.[4]

California Code of Regulations Title 24, Part 6: Energy Efficiency Standards
California Code of Regulations Title 24 Part 6 (California's Energy Efficiency Standards for Residential and Nonresidential Buildings) was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The California Energy Commission updates the Building Energy Efficiency Standards every three years; in addition to strengthening standards, updates allow consideration and possible incorporation of new energy-efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The California Energy Commission adopted the 2022 Energy Code on August 11, 2021, and in December of 2021, this new Code was approved by the California Building Standards Commission. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and more. It went into effect on January 1, 2023 (CEC 2022).

California Code of Regulations Title 24, Part 11: California Green Building Standards Code
California Code of Regulations Title 24, Part 11, (California's Green Building Standards Code), is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went into effect on January 1, 2011. These standards include a mandatory set of minimum guidelines, as well as more rigorous voluntary measures, for new construction projects to achieve specific green building performance levels. The Code is updated on a regular basis, with the most recent update consisting of the 2022 California Green Building Standards Code (CALGreen) that went into effect on January 1, 2023. The new standards build on the energy efficiency progress made within previous iterations. Local jurisdictions are permitted to adopt more stringent requirements, as State law provides methods for local enhancements. and improved the energy efficiency of newly constructed buildings and additions and alterations to existing buildings.

[4] There are 23 categories of appliances included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the State and those designed and sold exclusively for use in recreational vehicles or other mobile equipment.

Climate Adaptation Regulations

Public Resources Code, Section 71154

To address the vulnerabilities identified in the [state's climate adaptation strategy] plan, state agencies shall work to maximize, where applicable and feasible, all of the following objectives:

(a) Educating the public about the consequences of climate change, such as sea level rise, extreme weather events, the urban heat island effect, habitat loss, wildfire, drought, threats to infrastructure and agriculture, worsening air and water quality, and public health impacts.

(b) Ensuring there is a continued repository for scientific data on climate change and climate adaptation in the state in order to facilitate educated state and local policy decisions and to help identify primary risks from climate change to residents, property, communities, and natural systems across the state.

(c) (1) Promoting the use of the plan to inform planning decisions and ensure that state investments consider climate change impacts, as well as promote the use of natural systems and natural infrastructure, when developing physical infrastructure to address adaptation.

(2) When developing infrastructure to address adaptation, where feasible, a project alternative should be developed that uses existing natural features and ecosystem processes or the restoration of natural features and ecosystem processes to meet the project's goals.

(3) For purposes of this subdivision, “natural infrastructure” means using natural ecological systems or processes to reduce vulnerability to climate change related hazards, or other related climate change effects, while increasing the long-term adaptive capacity of coastal and inland areas by perpetuating or restoring ecosystem services. This includes, but is not limited to, the conservation, preservation, or sustainable management of any form of aquatic or terrestrial vegetated open space, such as beaches, dunes, tidal marshes, reefs, seagrass, parks, rain gardens, and urban tree canopies. It also includes systems and practices that use or mimic natural processes, such as permeable pavements, bioswales, and other engineered systems, such as levees that are combined with restored natural systems, to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people and wildlife.

(d) Encouraging regional collaborative planning efforts to address regional climate change impacts and adaptation strategies.

(e) Promoting drought resiliency through an integrated water supply, delivery, and capture system that is coordinated and that can be resilient to a multiyear drought scenario while protecting water quality and public health. Establishing both drought preparation programs, which will help create sustainable water systems in the future, and immediate drought response programs, which will reduce water demand or increase supply within one to five years of any declared drought.

(f) Building resilient communities by developing urban greening projects that reduce air pollution and heat reflection in urban areas and create livable, sustainable communities in urban cores to promote infill development and reduce greenhouse gas emissions.

(g) Protecting and enhancing habitat, species strongholds, and wildlife corridors that are critical to the preservation of species that are at risk from the consequences of climate change.

(h) Promoting actions to ensure healthy soils and sustainable agriculture; inform reliable transportation planning; improve emergency management response across sectors; ensure sufficient, reliable, and safe energy; improve capacity to reduce and respond to public health threats; address the impacts of climate change on disadvantaged communities; and protect cultural resources from the impacts of climate change.

(i) Prioritizing equity by ensuring public expenditures that address climate change adaptation prioritize protecting vulnerable communities, rectifying intersectional and systemic inequities, and enhancing low-income and vulnerable communities' abilities to weather the impacts of climate change.

Regional and Local Plans, Policies, Regulations and Ordinances

Bay Area Air Quality Management District

The most recent CEQA Air Quality Guidelines were published in April 2023 to assist lead agencies in evaluating air quality and climate impacts from proposed land use projects and plans in the SFBAAB. The Guidelines include nonbinding recommendations for how a lead agency can evaluate, measure, and mitigate air quality and climate impacts generated from land use construction and operational activities. BAAQMD's CEQA air quality guidelines include separate thresholds of significance for project- and plan-level analyses. At the project level, these thresholds are divided into operational, construction, and stationary sources. These thresholds are both qualitative and quantitative, and are extensively discussed in Chapter 6, "Project-Level Climate Impacts" of the air quality guidelines. At the plan level, thresholds are also both qualitative and quantitative. To be considered less-than significant, the plan must be consistent with current air quality plan control measures, and the projected growth rate of vehicle activity must be less than or equal to the project population growth rate.

San Joaquin Valley Air Pollution Control District

In August 2008, SJVAPCD's governing board adopted a climate change action plan. The plan authorized SJVAPCD's air pollution control officer to develop guidance documents to assist land use agencies and other permitting agencies in addressing GHG emissions during the CEQA process; investigate development of a GHG banking program; enhance the existing emissions inventory process to include GHG emission reporting consistent with state requirements; and administer voluntary GHG reduction agreements.

A staff report was released in November 2008 to provide a starting point for developing the items called for in the climate change action plan (SJVAPCD 2008). The report summarizes background information on global climate change, the current regulatory environment surrounding GHG emissions, and the various concepts involved in addressing the potential impacts of global climate change. The report also evaluates methodologies for estimating impacts and summarizes mitigation measures. No specific approach is recommended, but the report does present several methodologies for analysis that are currently being explored and vetted by other agencies.

In December 2009, SJVAPCD adopted the *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*, which established a method for evaluating the GHG impacts of development projects within SJVAPCD's jurisdiction (SJVAPCD 2009). SJVAPCD considers that demonstrating a 29 percent reduction in GHG emissions from business as usual would reduce a project's impact to a less-than-significant cumulatively significant impact.

2.7.3.6 Cultural Resources

Cultural resources in California are subject to a variety of federal and state laws and regulations. This section briefly describes the laws and regulations that apply to cultural resources at Carnegie SVRA.

Federal Laws and Regulations

Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations (36 CFR 800, as amended in 1999) requires federal agencies to consider the effects of their actions, or those they fund or permit, on properties that may be eligible for listing or are listed in the NRHP.

The NRHP is a register of districts, sites, buildings, structures, and objects of significance in American history, architecture, archaeology, engineering, and culture. The regulations provided in 36 CFR 60.4 describe the criteria used to evaluate cultural resources for inclusion in the NRHP. Cultural resources can be significant on the national, state, or local level. Properties may be listed in the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and (36 CFR 60.4):

a. are associated with events that have made a significant contribution to the broad patterns of our history;

b. are associated with the lives of persons significant in our past;

c. embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or

d. have yielded, or may be likely to yield, information important in prehistory or history.

To determine whether an undertaking could affect historic properties, cultural resources (including archaeological, historical, and architectural properties) must be identified, inventoried, and evaluated for listing in the NRHP. Although compliance with Section 106 is the responsibility of the lead federal agency, the work necessary to comply can be undertaken by others. The Section 106 review process involves a four-step procedure:

1. Initiate the Section 106 process by establishing the undertaking, developing a plan for public involvement, and identifying other consulting parties.
2. Identify historic properties by determining the scope of efforts, identifying cultural resources, and evaluating their eligibility for inclusion in the NRHP.
3. Assess adverse effects by applying the criteria of adverse effect on historic properties (resources that are eligible for inclusion in the NRHP).
4. Resolve adverse effects by consulting with the State Historic Preservation Officer (SHPO) and other consulting agencies, including the Advisory Council on Historic Preservation, if necessary to develop an agreement that addresses the treatment of historic properties.

If implementation of the Carnegie SVRA General Plan requires a CWA Section 404 permit from USACE, or any other federal permit, or if any federal funding is used to implement certain aspects of the General Plan, compliance with Section 106 is also required.

State Regulations and Laws

CEQA offers directives regarding impacts on historical resources, unique archaeological resources, and tribal cultural resources. CEQA states generally that if implementing a project would result in significant environmental impacts, then public agencies should determine whether implementing feasible mitigation measures or feasible alternatives can substantially lessen or avoid such impacts.

Significant cultural resources including historical resources, unique archaeological resources, and tribal cultural resources need to be addressed. The CEQA Guidelines define a “historical resource” as, among other things, “a resource listed or eligible for listing on the California Register of Historical Resources” (CRHR) (CEQA Guidelines, Section 15064.5[a][1]; see also PRC Sections 5024.1 and 21084.1). A historical resource may be eligible for inclusion in the CRHR, as determined by the State Historical Resources Commission or the lead agency, if the resource meets any of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage; or
2. Is associated with the lives of persons important in our past; or
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, a resource is presumed to constitute a “historical resource” if it is included in a “local register of historical resources” unless “the preponderance of evidence demonstrates that it is not historically or culturally significant” (CEQA Guidelines, Section 15064.5[a][2]). The CEQA Guidelines require consideration of unique archaeological sites (Section 15064.5). (See also PRC Section 21083.2.)

A “unique archaeological resource” is defined in PRC Section 21083.2 as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that the resource:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information,
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type, or
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological site does not meet the criteria for inclusion in the CRHR but does meet the definition of a unique archaeological resource as outlined in PRC Section 21083.2, it is entitled to special protection or attention under CEQA. Treatment options under Section 21083.2 include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a "unique archaeological resource").

Section 15064.5(e) of the CEQA Guidelines requires that excavation activities be stopped whenever human remains are uncovered, and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. Section 15064.5(d) of the CEQA Guidelines directs the lead agency to consult with the appropriate Native Americans as identified by the NAHC and directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

With the passage of AB 52, Section XVII "Tribal Cultural Resources" was added to Appendix G of the CEQA Guidelines, which includes checklist questions specifically pertaining to tribal cultural resources. Additionally, AB 52 requires public agencies to consult with tribes during the CEQA process. A resource is presumed to constitute a "tribal cultural resource" if it falls into one of the following two categories (CEQA Guidelines, Section 21074[a]).

1 Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either included or determined to be eligible for inclusion in the California Register of Historical Resources, or included in a local register of historical resources as defined in Section 5020.1 of the CEQA Guidelines
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe

California Public Resources Code

Activities in the planning area are subject to California PRC requirements related to historical resources and archaeological resources, as described below.

PRC Section 5021

The State Parks Department shall consider all recommendations for registration made by the commission, and shall register, as state historical landmarks, those buildings, structures, sites, or places which the department deems to be important historical resources and shall register, as points of historical interest, those buildings, structures, sites, or places which the department deems to be historical resources of sufficient historical interest to qualify for the placement of signs pursuant to Section 5022.5. The commission shall maintain a register which shall identify by number and description such historical landmarks and points of historical interest. The department may publish results of office and field archaeological investigation annually and shall issue additional publications, such as detailed site reports and area resource reports, as necessary, to inform the public and educational institutions.

Section 5024

PRC Section 5024 requires state agencies to make a good-faith effort to protect and preserve all state-owned historical resources under their jurisdiction. Each state agency must submit to the SHPO an inventory of all state-owned historical resources exceeding 50 years of age that are under its jurisdiction. PRC Section 5024.5 gives the SHPO the authority to review all efforts made by state agencies, to protect and preserve those resources from development and maintenance projects. The SHPO has instituted a memorandum of understanding with State Parks to complete Section 5024 *reviews* of all projects that could adversely affect significant historical resources. Archaeologists from the OHMVR Division of State Parks prepare a report of Section 5024 reviews for the SHPO annually.

After completing a cultural resources inventory of the planning area, archaeologists from the Anthropological Studies Center at Sonoma State *University* evaluated the significance of the resources. A cultural resource is considered significant if it meets the following criteria:

- it meets one of the significance criteria for either the CRHR or the NRHP, and
- it retains the characteristics of integrity that contribute to its CRHR significance or NRHP eligibility.

Completing the Section 5024 review process ensures that the OHMVR Division's projects follow the required standards for management and protection of cultural resources. Those guidelines are the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The following basic concepts underlie all treatments:

- Keep good documentation because it is essential to good management.
- Repair and retain historic fabric instead of replacing it.
- Replace with only "like-kind" materials, styles, finishes, colors, and craftsmanship.
- Avoid the false historicity that is created by using features that are undocumented or period styles that never were there.
- Make treatments reversible whenever possible.
- Protect archaeological resources.

To determine whether a project will affect a significant cultural resource, an OHMVR Division project manager prepares a project evaluation form and submits it to OHMVR Division archaeologists for review. Division archaeologists consult the most recent cultural resource geodatabase and cultural resource inventory prepared for the subject SVRA, and then prepare a Section 5024 report documenting the results of the investigation. The cultural resource is evaluated for significance according to NRHP and CRHR criteria. The Section 5024 report assesses potential impacts on the resource and describes mitigation measures. If the archaeologists determine that a project may have an adverse impact on significant cultural resources, project managers direct staff members to redesign the project, to avoid or *mitigate* those impacts.

Section 5097

PRC Section 5097 addresses archaeological resources. Archaeological resources that are not "historical resources" may be "unique archaeological resources" as defined in PRC Section 21083.2, which also generally provides that "nonunique archaeological *resources*" do not receive any protection under CEQA. PRC Section 21083.2(g) defines a "unique archaeological resource" as an archaeological artifact, object, or site that does not merely add to the current body of knowledge but has a high probability of meeting any of the criteria identified there. If an archaeological resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource are not considered to be a significant impact.

PRC Section 5097.5 states that unauthorized removal or destruction of archaeological or paleontological resources on sites located on public *lands* is a misdemeanor. In this case, "public lands" means lands owned by or under the jurisdiction of the state or any city, county, district, authority, or public corporation or its agent.

PRC Sections 5097.9 through 5097.991 (the California Native American Historic Resource Protection Act) establish the NAHC and its responsibilities with respect to Native American resources. State and local agencies are required to cooperate with the NAHC in carrying out those duties. The NAHC identifies and catalogs places that are of special religious or social significance to Native Americans and known graves and cemeteries of Native Americans on private lands. It also performs other duties to preserve and maintain the accessibility of sacred sites and burials and properly dispose of Native American human remains and burial items. If human remains of Native American origin are discovered, the NAHC is responsible for identifying the person(s) it believes to be the most likely descendant of the deceased Native American.

PRC Section 5097.98 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for such actions.

California Health and Safety Code

Activities in the planning area are subject to several sections of the California Health and Safety Code pertaining to the discovery and treatment of human remains.

Section 7050.5

Section 7050.5 of the Health and Safety Code includes the following requirements:

- It is a misdemeanor to knowingly mutilate or disinter, wantonly disturb, or willfully remove human remains, whether the remains are in a dedicated cemetery or elsewhere.
- If human remains are discovered outside of a dedicated cemetery, the site and nearby areas potentially overlying adjacent remains may not be excavated or disturbed further until the county coroner has:
  - found that the remains are not subject to legal provisions governing investigation of the circumstances, manner, and cause of the death; and
  - made recommendations to the person responsible for excavation (or a representative) about how to dispose of the remains.

  The coroner must decide within 2 working days after being notified of the discovery or recognition of the human remains.
- If the remains are not subject to the coroner's authority, but the coroner believes or has reason to believe that the human remains are those of a Native American, the coroner must contact the NAHC by telephone within 24 hours.

Section 7051

Under Health and Safety Code Section 7051, anyone who unlawfully removes human remains from their place of interment (or deposit while awaiting interment or cremation) without written permission and with intent to sell or dissect the remains is punishable by imprisonment in state prison. Section 7052 also notes that the willing mutilation, disinterment, or removal of known human remains from a place of interment is a felony.

Sections 8010–8011

Sections 8010–8011 of the Health and Safety Code establish a state repatriation policy and facilitate implementation of the federal Native American Graves Protection and Repatriation Act. The policy requires that all Native American physical remains, and cultural items be treated with dignity and respect, and encourages publicly funded agencies and museums in California to voluntarily disclose and return such remains and cultural items. The policy provides for mechanisms to aid Native American tribes, including those that are not federally recognized, in filing repatriation claims and obtaining responses to those claims.

California Government Code

Section 6254.10

Section 6254.10 of the California Government Code requires state and local agencies to keep confidential all records related to archaeological site descriptions, locations, reports, and records that are obtained through consultation with a Native American tribe.

Governor's Executive Order W-26-92

Governor's EO W-26-92, issued by Governor Pete Wilson on April 8, 1992, requires the preservation and wise use of California's cultural and historic resources. This executive order requires state agencies to carry out CEQA, the California Historical Building Code, and the state's historic resources preservation laws by recognizing, and to the extent prudent and feasible, preserving and maintaining the state's significant heritage resources. In accordance with these statutes, Governor's EO W-26-92 directs each state agency to:

- administer the cultural and historic properties under its control in a spirit of stewardship and trusteeship for future generations;
- initiate measures necessary to direct its policies, plans, and programs in such a way that state-owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people;
- ensure that the protection of significant heritage resources are given full consideration in all of its land use and capital outlay decisions; and
- institute procedures in consultation with the State Office of Historic Preservation to ensure that state plans and programs contribute to the preservation and enhancement of significant non-state-owned heritage resources.

2.7.3.7 Noise

Federal Regulations and Laws

The EPA Office of Noise Abatement and Control was established to coordinate federal noise control activities. After its inception, this EPA office implemented the federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health and welfare and the environment. Table 2-17 summarizes EPA's recommended guidelines for noise levels considered safe for community exposure. To prevent hearing loss over the lifetime of a receptor, the yearly average L_{eq} should not exceed 70 dB. To minimize interference and annoyance, noise levels should not exceed 55 dB L_{dn} at outdoor activity areas and 45 dB L_{dn} within residential structures.

EPA administrators determined in 1981 that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments.

Table 2-17. Summary of Noise Level Standards Recommended by the U.S. Environmental Protection Agency

Effect	Level	Area
Hearing loss	$L_{eq(24)} \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoor areas of residences and farms, and other areas where people spend widely varying amounts of time or where quiet is a basis for use.
Outdoor activity interference and annoyance	$L_{eq(24)} \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} \leq 45$ dB	Indoor residential areas.
Indoor activity interference and annoyance	$L_{eq(24)} \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Notes: dB = decibels; L_{dn} = day-night average sound level; $L_{eq(24)}$ = equivalent noise level (the sound energy averaged over a 24-hour period)
Source: EPA 1974

State Regulations and Laws

The *State of California General Plan Guidelines*, originally published in 2003 and updated in 2017 by the Governor's Office of Planning and Research, provides guidance for the compatibility of projects relative to environmental noise exposure levels (OPR 2017). Generally, residential uses are considered normally acceptable in areas where exterior noise levels do not exceed 60 dB CNEL/L_{dn}. "Normally acceptable" noise levels are those in which no special noise reduction techniques are required to achieve satisfactory living conditions. The guidelines also present flexibility and adjustment factors that may be used to arrive at noise acceptability standards reflecting the particular community's noise-control goals, sensitivity to noise, and assessment of the relative importance of noise issues.

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, occupational noise levels, and building noise insulation. For example, the California Vehicle Code specifies limits on noise produced by OHVs: Section 38370 states that OHVs cannot produce a maximum noise level exceeding 82 dB for vehicles manufactured in 1986 or later, while OHVs manufactured before 1986 cannot produce a maximum noise level exceeding 101 dB, when measured from a distance of 20 inches using test procedures established by the Society of Automotive Engineers under Standard J-1287, as applicable.

Local Regulations and Ordinances

Because Carnegie SVRA is owned by the State of California, it is not subject to compliance with San Joaquin or Alameda County policies or ordinances. However, it is the intent of State Parks to continue to operate the SVRA in a manner compatible with planning values expressed by the surrounding community; therefore, these policies and ordinances were considered as part of this environmental evaluation.

Alameda County General Plan Noise Element

The Noise Element of the *Alameda County General Plan* (Alameda County 1994e) does not provide quantitative land use compatibility standards; instead, it recognizes EPA's noise level standards for residential land uses. These standards include an exterior limit of 55 dB L_{dn} and an interior limit of 45 dB L_{dn}. The Noise Element also refers to the noise and land use compatibility standards developed by an ABAG-sponsored study that establishes a "normally acceptable" limit of 60 dB CNEL/L_{dn} and a "conditionally acceptable" limit of 70 dB CNEL/L_{dn} for residential land use. Levels exceeding 70 dB CNEL/L_{dn} are considered "unacceptable."

Alameda County Municipal Code

Section 6.60.040 of the Alameda County Municipal Code establishes regulations and standards for noise exposure at sensitive land uses. The regulations identify exterior noise levels from non-transportation sources affecting residential or commercial land uses and establish limits on daytime and nighttime noise levels and cumulative noise levels during a 1-hour period.

San Joaquin County General Plan Noise Element

San Joaquin County regulates noise through the objectives and policies presented in the Public Health and Safety Element of the *San Joaquin County General Plan* (San Joaquin County 2016). The Public Health and Safety Element contains thresholds for maximum acceptable noise exposure at noise-sensitive land uses. For transportation noise sources, maximum allowable noise exposure levels are established for both outdoor activity areas and interior spaces and range from 45 to 65 dB L_{dn}. For non-transportation noise sources, the Public Health and Safety Element establishes maximum hourly equivalent sound levels at outdoor activity areas of 50 dB or less during the daytime and 45 dB during the nighttime and maximum sound levels of 70 dB during the daytime and 65 dB during the nighttime. Public Health and Safety Element policies also state that development must be planned and designed to minimize noise impacts on neighboring noise-sensitive areas and noise interference from outside noise sources.

San Joaquin County Development Title (Municipal Code)

Section 9-1025.9 of the San Joaquin County Development Title prohibits excessive noise that is incompatible with nearby sensitive land uses:

- Construction activities conducted between 6 a.m. and 9 p.m. on any day are exempt from the County's noise standards. Furthermore, construction/demolition of structures or infrastructure and vibration caused by motor vehicles or trains are exempt from the County's vibration standards.
- Projects that will result in new stationary noise sources must not create daytime (7 a.m.–10 p.m.) noise levels over 50 dB hourly L_{eq} or nighttime (10 p.m.–7 a.m.) noise levels over 45 dB hourly L_{eq} at the nearest location of off-site, noise-sensitive outdoor activity.
- Maximum sound levels (L_{max}) must not exceed 70 dB in the daytime or 65 dB in the nighttime at the nearest location of off-site, noise-sensitive outdoor activity. Where the location of outdoor activity areas is unknown or is not applicable, the noise standard shall be applied at the property line of the receiving land use.
- For single-tone noise (such as a hum), impulsive noise, or noise consisting primarily of speech or music, these standards are reduced by 5 dB.

Vibration at any lot line must not be perceptible, except within industrial zones.

Table 9-1025.9 of the San Joaquin County Development Title summarizes noise exposure levels permitted at noise-sensitive land uses from transportation and stationary noise sources.

2.7.3.8 Transportation and Traffic

Federal Regulations and Laws

No federal regulations or laws related to transportation and traffic are applicable to the planning area.

State, Regional, and Local Regulations, Laws, and Ordinances

Because Carnegie SVRA is owned by the State of California, it is not subject to compliance with San Joaquin or Alameda County policies or ordinances. However, it is the intent of the State Parks to continue to operate the SVRA in a manner compatible with planning values expressed by the surrounding community; therefore, these policies and ordinances were considered as part of this environmental evaluation.

SB 743

Governor Brown signed SB 734 in September 2013, which created a process to change the way that transportation impacts are analyzed under CEQA. Specifically, SB 743 required the OPR to amend the CEQA guidelines to provide an alternative to the LOS for evaluations transportation impacts as well as recommended methodologies and significance thresholds. SB 743 does not change the discretion that the lead agencies have to select methodology or define significance thresholds. Under SB 743, the focus of transportation analysis essentially shifted from the social inconvenience of traffic congestion to adverse physical effects associated with vehicular travel demand. Measurements of transportation impacts may include total vehicle miles travelled (VMT), vehicle miles traveled VMT per capita, automobile trip generation rates, or automobile trips generated. Vehicle miles traveled, or VMT, has long been a common metric to use to measure travel demand. A VMT is one vehicle traveling on a roadway for one mile. Many communities have been estimating and developing policies related to VMT for years, including estimates and goals for VMT per person, VMT per employee, or other methods of normalization. SB 743 directs revisions to the CEQA guidelines that would create criteria for assessing travel demand, such as “vehicle miles traveled, vehicle miles traveled per capita, automobile trips generate” (OPR 2018).

Level of Service Standards

The quality of traffic flow through intersections and on individual roadway segments is described in terms of operating LOS. LOS is a qualitative measure of traffic operating conditions. A letter grade of A, B, C, D, E, or F, corresponding to progressively worsening operating conditions, is assigned to an intersection or roadway segment. Table 2-18 presents the characteristics associated with each LOS grade.

Table 2-18. Definitions of Level of Service

Level of Service	Intersections	Roadway (Daily)
A	Uncongested operations; all queues clear in a single signal cycle.	Completely free flow.
B	Very light congestion; an occasional approach phase is fully utilized.	Reasonably unimpeded operations with slightly restricted maneuverability.
C	Light congestion; occasional backups on critical approaches.	Stable operations with somewhat more restrictions in making mid-block lane changes than LOS B.
D	Significant congestions of critical approaches, but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed.	Approaching unstable operations.
E	Severe congestion with some long-standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es).	Operations with significant intersection approach delays and low average speeds.
F	Total breakdown; stop-and-go operation.	Operations with extremely low speeds.

Note: LOS = level of service
Source: Transportation Research Board 2010

The *Highway Capacity Manual* (Transportation Research Board 2010) presents methodologies for calculating practical capacity and LOS on roadways and at intersections. At signalized intersections and intersections controlled by all-way stop signs, traffic conditions are described in terms of the average length of the delays experienced by all motorists. Intersection configuration, traffic volumes, and traffic signal timing are all factors used when determining the length of average delay and the resulting LOS. The delays experienced at intersections controlled by side-street stop signs are different. Motorists

waiting to turn must yield the right-of-way to through traffic, and the length of delays can vary on each approach to the intersection.

Signal Warrant Procedures

Traffic signal warrants are a series of standards that provide guidelines for determining whether installing a traffic signal at an intersection is appropriate. Signal warrant analyses are typically conducted at intersections of uncontrolled major streets and stop sign–controlled minor streets where the minor street experiences significant delay. If one or more signal warrants are met, signalizing the intersection may be appropriate.

However, a signal should typically be installed only if warrants are met. Installing a signal increases delay on the previously uncontrolled major street and may increase the intersection's overall vehicle delay. Adding a traffic signal may also increase the likelihood of certain types of accidents. Therefore, if traffic signals are installed at locations that do not meet warrants, the detriment of increased accidents and overall delay may be greater than the benefit to traffic operating conditions at the minor-street approach experiencing the greatest delays.

2.7.3.9 Visual Resources

Federal and State Regulations and Laws

No federal, state, or local plans, policies, regulations, or laws apply to visual resources at Carnegie SVRA.

Local Regulations and Ordinances

Because the SVRA is owned by the State of California, it is not subject to compliance with local regulations, including Alameda or San Joaquin County policies or ordinances. However, State Parks intends to continue to operate the SVRA in a manner compatible with the values expressed by the surrounding community; therefore, these policies and ordinances were considered as part of this environmental evaluation.

The goal for sensitive viewsheds in the *East County Area Plan* of the *Alameda County General Plan* is to preserve unique visual resources and protect sensitive viewsheds with policies that include guidelines in respect to ridgelines, community separators (open space), trees, other landscaping, grading, and utilities in areas that are near the cities of Pleasanton, Dublin, and Livermore (Alameda County 2002).

The Scenic Resources section in the Natural and Cultural Resources section of the *San Joaquin County General Plan* (San Joaquin County 2016) contains goals and policies that address scenic resources in the county, including enhancement of scenic routes. Corral Hollow Road is identified as a scenic route, and San Joaquin County supports litter removal, provision of parking at desirable viewpoints, landscaping plans for development, and the use of design guidelines. The intent of the county's scenic designation is that development proposals should not detract from the visual and recreational experience along these routes. The general plan also calls for views of waterways, hilltops, and oak groves from public lands and roadways to be protected.

2.7.4 Trends and Projections

2.7.4.1 Recreation Trends

Federal research on OHV use indicates that the number of the OHV recreationists has been growing nationwide, and a larger proportion of people under age 30 are participating in OHV activities. The same research found that OHV users participate more in almost every recreation activity than the general U.S. population age 16 and older. The typical OHV recreationist is white, male, and under 50 years old (Cordell et al. 2008). According to State Parks research and polling, residents in Northern California think that OHV areas are important (State Parks 2009b).

About 19 percent of people 16 and older nationwide participate in some type of OHV activity. In California, the percentage of the population is slightly lower, around 18 percent. In the Pacific region (which includes

California), almost one-third of people between 16 and 30 participate in OHV activities. About 30 percent of American Indians, 23 percent of whites, 16 percent of blacks, 11 percent of Asians, and 14 percent of Hispanics participate in OHV activities. The rate of participation for Hispanics in the Pacific region is significantly lower than Hispanics' nationwide participation. Hispanics nationwide participated at more than twice the rate in 2007 (26 percent) than in 1999 (13 percent), while both white and black American participation rates did not change substantially. Participation rates increase as family income increases. In the Pacific region, those with family incomes of $25,000 or less have a 12 percent participation rate, while those with family incomes greater than $150,000 have a 27 percent participation rate. Even though the participation rate is not the highest, those making $25,000 to $49,999 have the most participants in the Pacific region (1.5 million). Those with some college or with a high school diploma have the highest participation rates (22 percent and 21 percent, respectively), with participation rates dropping to 13 percent for those with a postgraduate degree (Cordell et al. 2008).

2.7.4.2 Regional Demographics

Alameda and San Joaquin Counties had a combined population of more than 2.4 million people in 2021. The two cities closest to Carnegie SVRA are Livermore and Tracy, with populations of about 86,000 and 95,000, respectively. According to the U.S. Census, Alameda County grew by about 11 percent between 2010 and 2021, while San Joaquin County grew by about 14 percent and the city of Tracy grew by 15 percent (Table 2-19). According to California Department of Finance projections, it is estimated that San Joaquin County will continue to grow at high rates for the next 40 years.

Table 2-19. City and County Population Growth

City/County	2010	2020	2060	% Increase (2010–2020)	% Increase (2020–2060)
Livermore	80,968	88,487	NA	9.3%	NA
Tracy	82,922	95,387	NA	15.0%	NA
Alameda County	1,510,271	1,676,458	1,959,165	11.0%	16.9%
San Joaquin County	685,306	780,207	996,241	13.8%	27.7%

Note: NA = not available
Sources: DOF 2021

Alameda County is predominantly white, Asian, and Hispanic while San Joaquin County is primarily white and Hispanic (Table 2-20). As described previously, Hispanic participation rates in OHV recreation have increased in the past few years.

Table 2-20. Race/Ethnicity in Alameda and San Joaquin Counties in 2022

Race/Ethnicity	Alameda County	%	San Joaquin County	%
Not Hispanic or Latino:	1,263,602	81.4%	505,287	63.7%
White	475,479	29.2%	224,484	28.3%
Black or African American	174,234	10.7%	65,838	8.3%
American Indian and Alaska Native	17,911	1.1%	16,658	2.1%
Asian	550,383	33.8%	146,747	18.5%
Native Hawaiian and Other Pacific Islander	16,284	1.0%	7,139	0.9%
Other	91,188	5.6%	44,421	5.6%
Hispanic or Latino	364,751	22.4%	341,089	43%
Total*	1,628,353	103.8%	793,229	106.7%

Sources: U.S. Census Bureau 2022a, 2022b, *Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences.

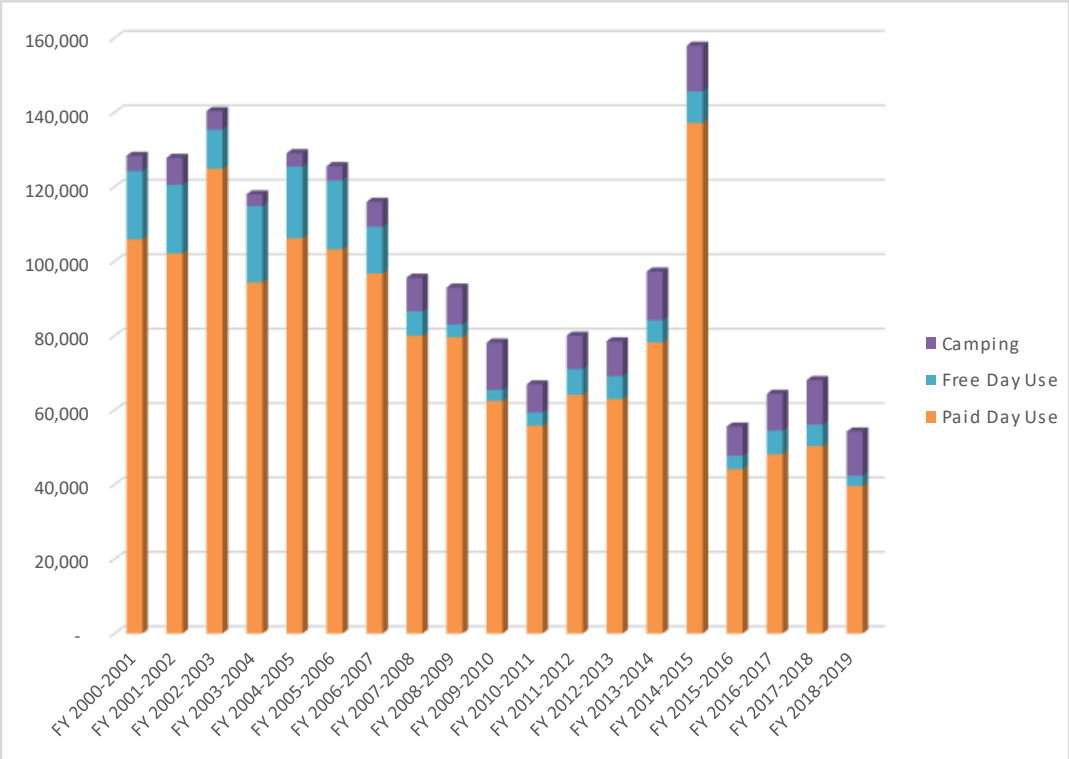
The median age in Alameda and San Joaquin Counties has increased in recent years. The 2000 U.S. Census recorded median ages of 34.5 and 31.9 for Alameda County and San Joaquin County, respectively; the 2020 U.S. Census recorded median ages of 37.8 and 34.4 years for the two counties (U.S. Census Bureau 2000a, 2000b, 2020a, 2020b).

2.7.4.3 Carnegie SVRA Visitation

Over the last 20 years, Carnegie SVRA has hosted an average of 99,000 visits each year. Attendance peaked in the early 2000s and in 2015 stayed fairly steady until fiscal year 2007–2008, when a drop-off in attendance occurred (Figure 2-24). (Please note that these attendance figures are collected locally and may differ from attendance reported in annual State Parks statistical reports because of differences in reporting special-event attendance.) The decrease could have been caused in part by the 2008 recession and the resulting decrease in disposable household incomes. The most recent data from fiscal years 2015 through 2019 show a decrease in visitors from the spike as well as conditions before the spike.

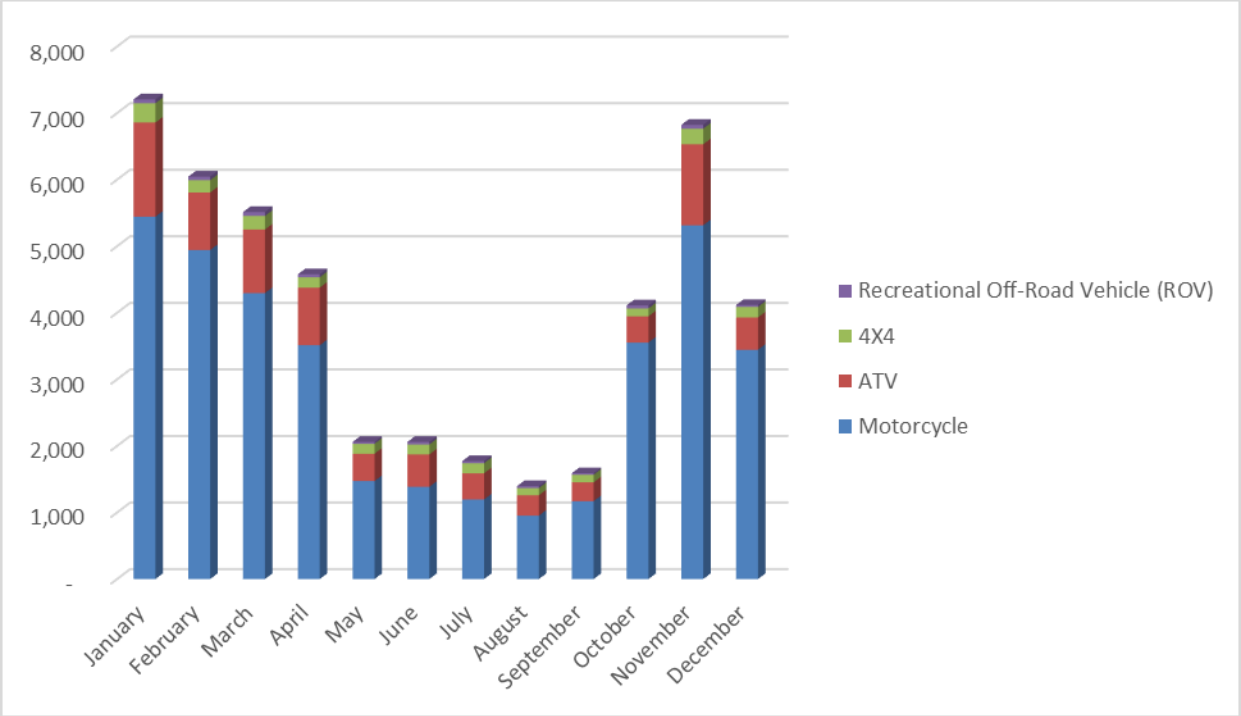
Most visits to Carnegie SVRA occur from October through April, which is also the time period when red-sticker vehicles are allowed to ride at the SVRA (Figure 2-25). Few special events are currently held at the SVRA; these consist mainly of four annual hillclimb competitions and a visitor appreciation day. For the last few years, the visitor appreciation day has occurred in October. In previous years, the SVRA hosted other events, including hare scrambles and motocross races.

As described in Chapter 1, “Introduction,” the planning team conducted an online survey of visitors and potential visitors. The median distance that visitors travel from home to Carnegie SVRA is 31 miles. The SVRA also attracts visitors from around the state and across the country, mostly for hillclimb competitions. Most visitors over 18 are between the ages of 36 and 55. If visitors bring children, the children are most often between the ages of 10 and 17. Close to 60 percent of visitors said they bring an average of two children each time they visit the SVRA, with the most popular subgroup being 14- to 17-year-olds (State Parks 2013c).



Source: Data provided by State Parks and adapted by AECOM in 2023.

Figure 2-24. Attendance at Carnegie SVRA over Time, by Pass Type



Source: Data provided by State Parks and adapted by AECOM in 2023

Figure 2-25. Average Attendance at Carnegie SVRA by Month, 2020-2022

The main attraction of the SVRA is its off-highway motorcycle trails. About 80 percent of the visitors surveyed come to ride off-highway motorcycles on the trails in the hills. Of the many facilities offered at Carnegie SVRA, the off-highway motorcycle trails are preferred over other facilities such as the ATV track or 4x4 challenge area. The SVRA's location close to home and the presence of off-highway motorcycle trails led respondents to choose Carnegie SVRA over other OHV areas available to them.

Conditions That Have Affected Visitor Access

Certain conditions have necessitated park managers to restrict or limit visitor access to Carnegie SVRA. For example, some or all of the SVRA was closed for several months during the 2020 COVID-19 epidemic to protect public safety. Carnegie SVRA was closed in 2015, 2019, 2020, and briefly in 2022 due to wildfires on the property or close to it. Creek flooding and related infrastructure damage have also prompted partial closures of the SVRA. The SRI crossing was damaged by flooding in 2017, and in 2023, the park was closed for 100+ days due to flooding from the atmospheric river storms. Access to the SVRA from Livermore on Tesla Road was closed for 4-6 weeks in 2023 while Alameda County Public Works repaired a slide. Carnegie's Stormwater Management Plan has policies to close areas of the park after rainfall reaches a certain amount to protect water quality.

2.7.5 Future Opportunities

As described previously, most visitors come to Carnegie SVRA to ride off-highway motorcycles; however, there have been longstanding desires for a SVRA that would serve users of other OHV types. State Parks has tried to accommodate 4WD recreation with development of the 4x4 challenge area. However, most of Carnegie SVRA is too steep for 4WD vehicles and ATVs.

A group enjoying the 4x4 challenge area.

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