Carnegie
STATE VEHICULAR RECREATION AREA
General Plan Revision

Preliminary General Plan

April 2015

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Prepared for:

California State Parks
Off-Highway Motor Vehicle Recreation Division

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ACRONYMS AND OTHER ABBREVIATIONS

ºF	degrees Fahrenheit
4WD	four-wheel-drive
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ARB	California Air Resources Board
ATV	all-terrain vehicle
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*
BMP	best management practice
B.P.	Before Present
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California ambient air quality standards
CAFE	corporate average fuel economy
cal B.P.	calibrated radiocarbon years Before Present
CASSP	California Archaeological Site Stewardship Program
CBC	California Building Standards Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CR	Cultural Resource Management (goals and guidelines)
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CTR	California Toxics Rule

CWA	Clean Water Act
dB	decibel(s)
dBA	A-weighted decibel(s)
DEIR	draft environmental impact report
DMS	data management system
EACCS	*East Alameda County Conservation Strategy*
EBRPD	East Bay Regional Park District
EIR	environmental impact report
EISA	Energy and Independence Security Act of 2007
EPA	U.S. Environmental Protection Agency
ESA	federal Endangered Species Act
ET	evapotranspiration
FEIR	final environmental impact report
FEMA	Federal Emergency Management Agency
General Plan	*Carnegie State Vehicular Recreation Area General Plan*
Geo	Geology (goals and guidelines)
GHG	greenhouse gas
GPS	global positioning system
HHWP	Hetch Hetchy Water and Power
HMS	Habitat Monitoring System
I-580	Interstate 580
IE	Interpretive and Educational (goals and guidelines)
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
LLNL	Lawrence Livermore National Laboratory
L_{max}	maximum sound level
LOS	level of service
M	moment magnitude
MCV	*Manual of California Vegetation*
MLD	most likely descendant
MMT	million metric tons
mm/yr	millimeters per year
mph	miles per hour
MPO	metropolitan planning organization
MRZ	Mineral Resource Zone
MS4	Municipal Separate Storm Sewer System
MTC	Metropolitan Transportation Commission
Mw	maximum moment magnitude

NAHC	Native American Heritage Commission
NEL	numeric effluent limitation
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 (goals and guidelines)
OHMVR	Off-Highway Motor Vehicle Recreation
OHV	off-highway vehicle
OHV BMP Manual	*OHV BMP Manual for Erosion and Sediment Control*
OM	Park Operations and Maintenance (goals and guidelines)
PG&E	Pacific Gas and Electric Company
PM	particulate matter
$PM_{2.5}$	fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less
PM_{10}	respirable particulate matter with an aerodynamic diameter of 10 micrometers or less
Porter-Cologne Act	Porter-Cologne Water Quality Control Act of 1969
POTW	Publicly Owned Treatment Works
PRC	California Public Resources Code
ROV	recreational off-highway vehicle
RWQCB	regional water quality control board
SB	Senate Bill
Scoping Plan	*Climate Change Scoping Plan*
SFBAAB	San Francisco Bay Area Air Basin
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*
SPPO	State Parks peace officer
SRI	SRI International
State Parks	California Department of Parks and Recreation
SVP	Society of Vertebrate Paleontology
SVRA	State Vehicular Recreation Area
SWMP	*Storm Water Management Plan for Carnegie SVRA*
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
T-BACT	best available control technology for toxic air contaminants

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
VEO	Visitor Experience and Opportunities (goals and guidelines)
VM	Visitor Management (goal and guidelines)
WDR	waste discharge requirement

CHAPTER 1 – INTRODUCTION

1.1 LOCAL AND REGIONAL CONTEXT

Carnegie State Vehicular Recreation Area (Carnegie SVRA or the SVRA) is located in Alameda and San Joaquin Counties (Figure 1-1) approximately 60 miles southeast of San Francisco, 12 miles east of Livermore, and 12 miles southwest of Tracy. The SVRA lies south of Corral Hollow Road/Tesla Road. 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 in either county.

A family riding together at Carnegie SVRA

State Parks staff member traveling along an existing ranch road in the expansion area

1.2 PURPOSE OF ACQUISITION

Carnegie SVRA became a unit of the State Park system in July 1980. The original 1,575-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, Section 5006.48) authorized State Parks to plan, acquire, and develop the site for OHV use. From 1996 to 1998, State Parks used legislatively appropriated OHV Trust Funds to acquire an additional 3,100 acres of neighboring lands to provide expanded OHV recreation opportunities. The additional acreage was classified as SVRA lands and added to Carnegie SVRA. The additional acreage is referred to as the expansion area.

View of camping area from trails

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 and single riders who want to ride for a few hours, camp and ride for several days, or compete in or watch hillclimb or other special events. The expansion area comprises former grazing land among rolling hills and flat spaces where coal, sand, and gravel mining operation occurred; associated historic towns sprung up; and clay and potter production once thrived. The expansion

Carnegie SVRA entrance station

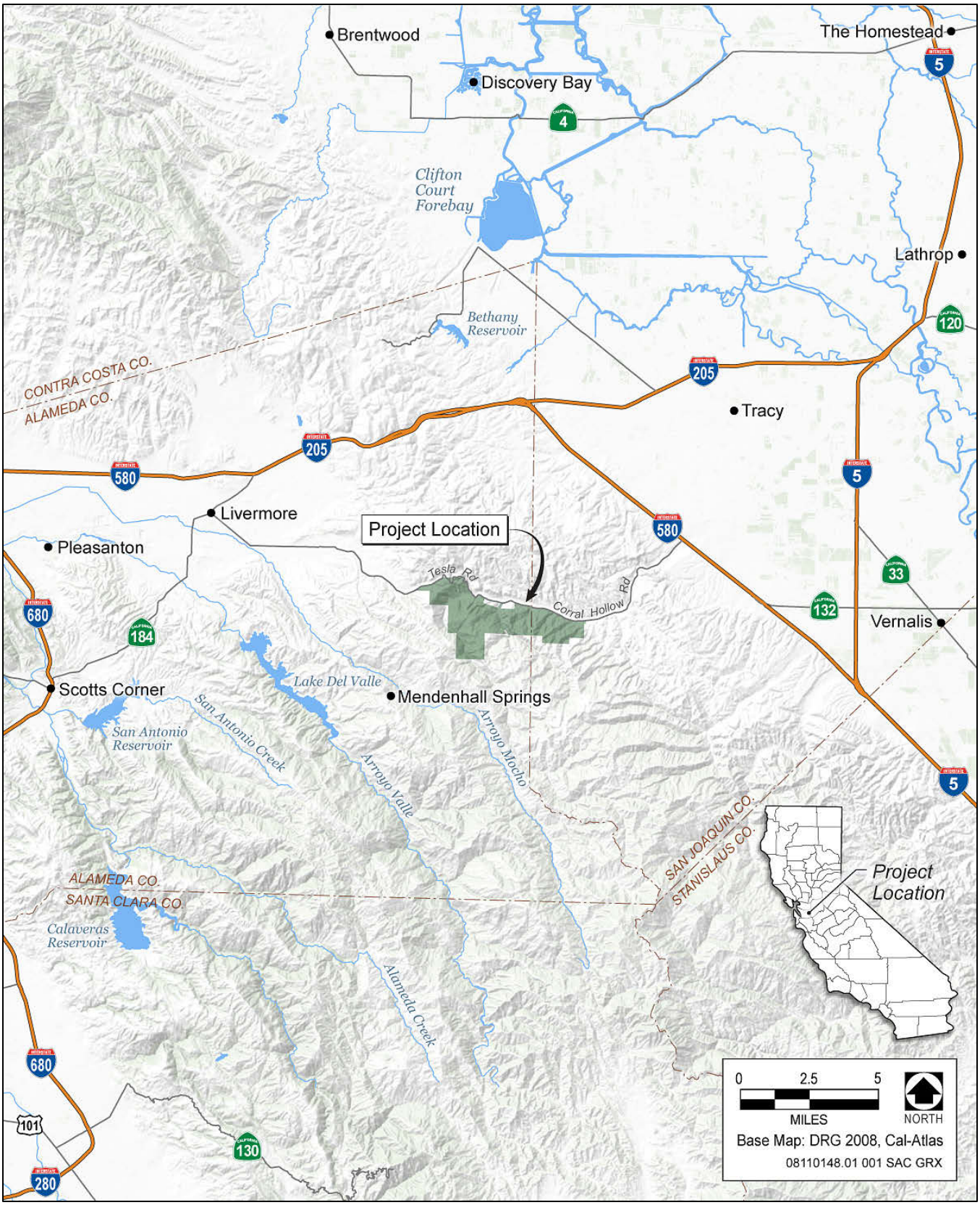


Figure 1-1. Vicinity Map

area also includes scattered sites that are the remains of seasonal occupation by the Northern Valley Yokuts and Ohlone before the arrival of Europeans. Hilltop views stretch out across the landscape, including farm roads and indications of livestock grazing activities.

1.4 SITE CHARACTERISTICS

Carnegie SVRA is made up of 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.

View of Corral Hollow Canyon from the expansion area

The SVRA's entrance is off Corral Hollow Road. The planning area for this *Carnegie State Vehicular Recreation Area General Plan* (General Plan) revision consists of 4,675 acres: the original 1,575-acre SVRA and a 3,100-acre expansion area. State Parks also owns an additional 340 acres of immediately adjacent property, but that acreage is not part of the planning area because of deed restrictions (Figure 1-2):

- An area of approximately 225 acres north of Tesla Road was purchased as buffer land; uses of that land are restricted to residential and light agricultural.
- An area of about 110 acres south of Tesla Road is restricted to residential uses because it provides a buffer between the expansion area and non-state-owned residential properties.
- An area of about 5 acres north of Corral Hollow Road across from the original Carnegie SVRA contains a water treatment plant.

The lands outside of the planning area that are owned by State Parks will not be governed by this General Plan.

1.5 PURPOSE OF THE GENERAL PLAN

State Parks adopted the first general plan for Carnegie SVRA in 1981. Much has changed in the 30 years since adoption of the plan; for example, new properties have been acquired and environmental laws have been updated. Revising the Carnegie SVRA General Plan will result in a new broad-based policy document that establishes a long-range vision for the SVRA (including the expansion area) 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 do not expire; rather, they are reconsidered for amendments or revisions when circumstances and needs dictate, such as when additional land is acquired, or when substantial development considerations arise that were not addressed in the general plan or evaluated during the general plan process.

1.6 ORGANIZATION OF THE GENERAL PLAN

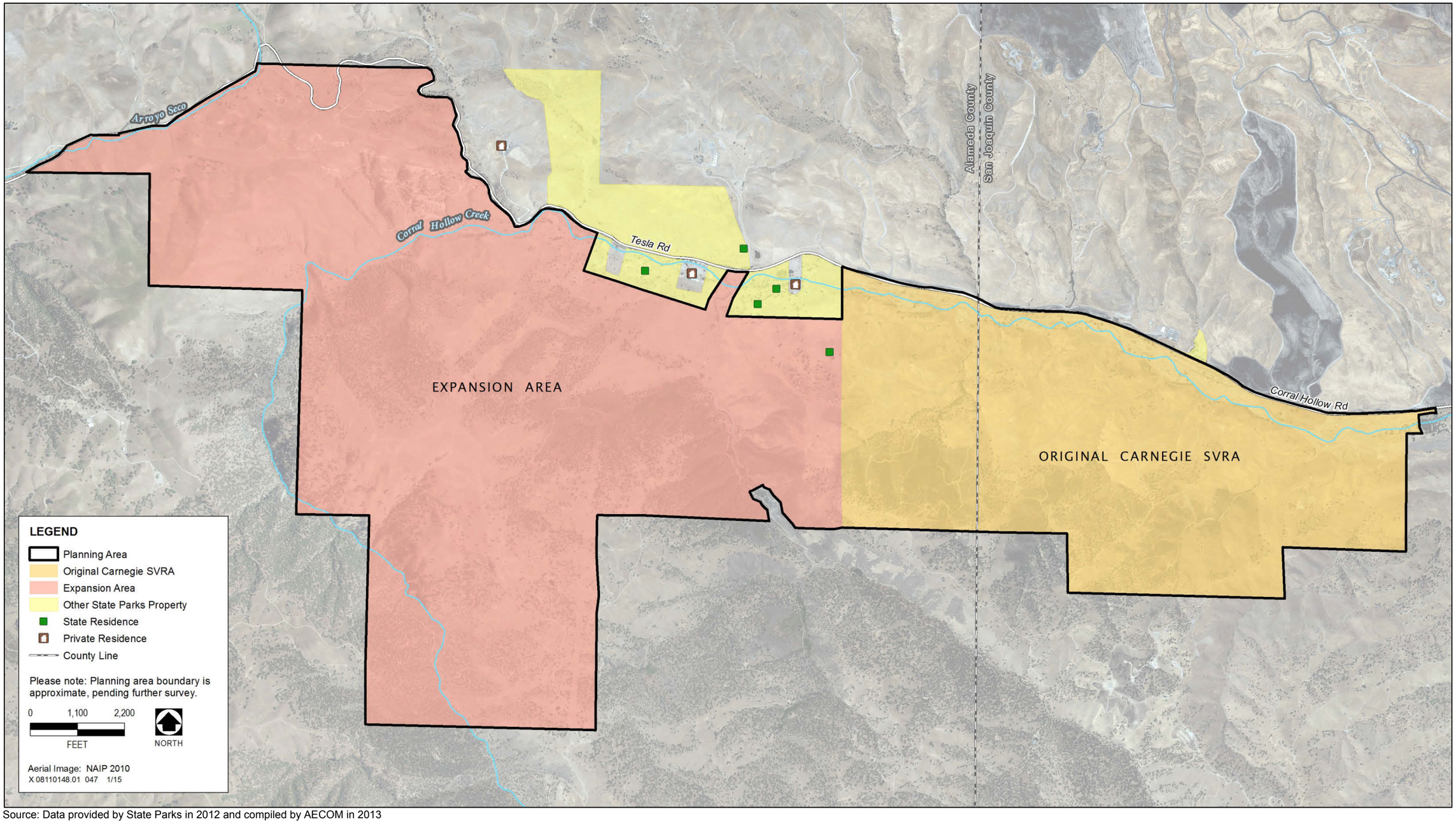
This Carnegie SVRA General Plan is organized into five chapters:

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

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 development of future programs and projects, which may include management plans 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) would be inconsistent with the General Plan, the General Plan must be amended or revised before the program or project could be implemented, and California Environmental Quality Act (CEQA) compliance would be required.

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 of the points required by Article 9 of the CEQA Guidelines: existing setting, impact analysis, alternatives analysis, and cumulative impacts. The EIR is an accompanying document to this General Plan, prepared as a separate volume.



Source: Data provided by State Parks in 2012 and compiled by AECOM in 2013

Figure 1-2. Planning Area

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)

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. Impact minimization measures have been incorporated into the General Plan wherever possible to help ensure that planned actions described in the General Plan, including future actions, will not cause significant environmental impacts.

Therefore, the CEQA analysis detailed in the EIR accompanying this General Plan is intended to be adequate for future projects, as long as they are implemented in a manner consistent with the General Plan's goals and guidelines. 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. 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 are applicable to the use of this General Plan and accompanying DEIR 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 reasonable 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: 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. Figure 1-3 illustrates the eight major steps.

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 stakeholders are described in Section 1.8.3. Existing conditions information, the opportunities and constraints summary, and public, stakeholder, and agency input on land use alternatives were combined to develop goals, guidelines, and a land use plan.

Biologists conducting a reconnaissance-level biological resources survey

1.8.2 PLANNING FRAMEWORK

The Carnegie SVRA General Plan was prepared 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 the Off-Highway Motor Vehicle Recreation (OHMVR) Division. Table 1-2 describes the planning hierarchy that provides direction for the future of Carnegie SVRA.

Carnegie SVRA
General Plan and EIR Process: Step-by-Step

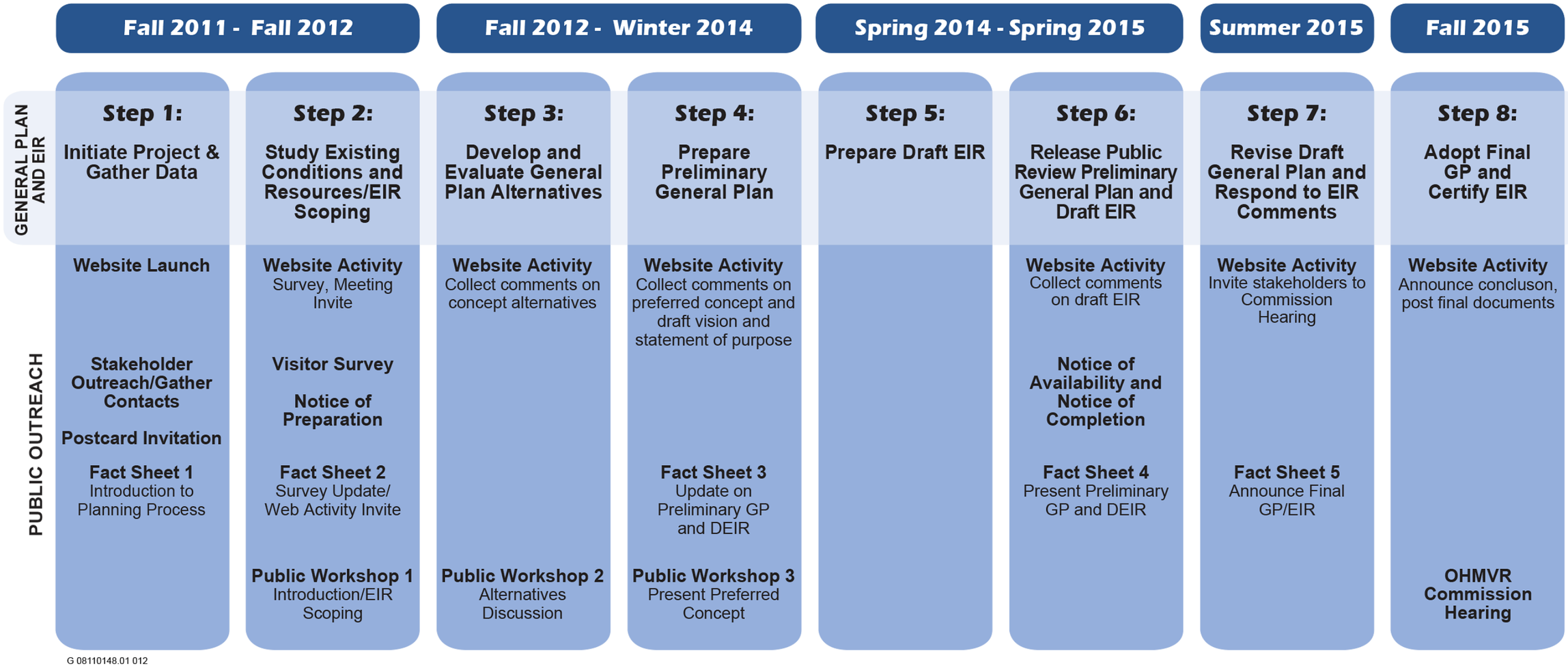


Figure 1-3. The General Plan Process

Table 1-2. Planning Hierarchy for Carnegie SVRA

Planning Concept	Description
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 that the OHMVR Division will consider 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 INTERAGENCY AND STAKEHOLDER INVOLVEMENT

The planning team sought input from a wide variety of agencies, stakeholders, members of the public, and SVRA and OHMVR Division staff. The goal of the outreach program was to facilitate development of a revised Carnegie SVRA General Plan that enjoys broad acceptance among stakeholders and staff. To that end, the planning team facilitated many meetings to collect input and present updates, maintained a General Plan website, conducted an online survey, announced meetings through e-mail blasts and mailings, and collected input in multiple formats. The team considered input from agencies, stakeholders, staff members, and the public when developing the draft concepts, goals, guidelines, existing conditions, and environmental analysis. The various outreach efforts conducted during the Carnegie SVRA General Plan process are described immediately below.

Public meeting attendees in June 2013

AGENCY COORDINATION

The planning team maintained open communications with a variety of agencies during General Plan development. The following discussions and meetings were held:

- **Introduction Meeting:** The planning team invited a wide range of agencies[1] to attend a meeting on August 23, 2012, to introduce the Carnegie SVRA General Plan revision process and ask for initial input.

- **East Bay Regional Park District (EBRPD) Introduction Meeting:** The planning team met with key representatives of EBRPD on July 10, 2012, to discuss the Carnegie SVRA General Plan, lessons that EBRPD learned from working on the Eastshore State Park General Plan, and ways in which EBRPD and State Parks can work together on areas of common interest.

- **Tour of EBRPD Black Diamond Mines Regional Preserve:** EBRPD provided a tour of the Black Diamond Mines Regional Preserve to the planning team on September 27, 2012, so that the team could see how EBRPD has provided recreation and education opportunities at a mine site similar to the Tesla Coal Mine Site.

East Bay Regional Park District staff members share their experiences at Black Diamond Mines.

- **Hollister Hills SVRA Tour:** The planning team provided a tour of Hollister Hills SVRA to representatives of the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and Central Valley Regional Water Quality Control Board on November 7, 2012, to show them how State Parks has planned OHV recreation and trails while managing resources in a sustainable manner.

- **Carnegie SVRA Tour:** The planning team provided a tour of the original Carnegie SVRA and expansion area to representatives of the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and Central Valley Regional Water Quality Control Board on December 13, 2012.

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 Native California Indians 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

[1] The organizations that attended were American Medical Response, California Department of Transportation, Central Valley Regional Water Quality Control Board, Alameda County, California Department of Fish and Wildlife, SRI International, U.S. Fish and Wildlife Service, San Joaquin County, and San Francisco Public Utilities Commission.

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 conducts Native American consultation in accordance with Departmental Notice 2007-05 and Governor's Executive Order B-10-11.

As part of Native American consultation, OHMVR Division archaeologists contacted the Native American Heritage Commission (NAHC) to request a record search of the sacred lands files and a Native American contact list for the planning area. The NAHC's review of the sacred lands files failed to identify sacred sites within Carnegie SVRA; however, consultation with the Native American tribes on the NAHC contact list, which included site visits with five Native American groups between August and October 2012, identified two sacred sites. 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.

STAKEHOLDER OUTREACH

The planning team met with key stakeholders from different interest groups, namely the environmental community, neighbors of Carnegie SVRA, OHV user/rider groups, the SVRA concessionaire, and historical societies. The outreach effort included an introductory meeting with each group and attendance at regular group meetings, when requested. The goal of the introductory meetings was to offer a more intimate forum to hear about the stakeholders' particular concerns, answer questions, and collect input on solutions the stakeholders would like to see incorporated into the Carnegie SVRA General Plan. Tours were typically offered on request after the first introductory meeting. These tours are described in more detail below, under "Tours of the Planning Area,"

A Carnegie SVRA interpreter operates the booth during an event and hands out General Plan information.

- **Environmental Stakeholders Introductory Meeting:** This stakeholder meeting for the Carnegie SVRA General Plan was held on September 17, 2012. In attendance were representatives from the Sierra Club, Friends of Tesla Park, the Center for Biological Diversity via phone, and Public Employees for Environmental Responsibility via phone. Because the representatives from the Center for Biological Diversity and Public Employees for Environmental Responsibility were on the phone and may have found participating difficult, the planning team called and/or e-mailed them to determine whether they would like to have an in-person meeting. None of the representatives responded to these invitations.

- **SVRA Neighbors Introductory Meeting:** This stakeholder meeting was held on November 6, 2012. Attendees included SVRA neighbors, along with representatives from the San Francisco Public Utilities Commission and SRI International.

- **User/Rider Groups and SVRA Concessionaire Introductory Meeting:** This stakeholder meeting was held on November 13, 2012. Attendees included representatives from the Blue Ribbon Coalition, California Association of 4WD Clubs, California Off-Road Vehicle Association, Carnegie Forever, Cycle Specialties, District 36, MotoMart Concessionaire, and Wandering Wheelers.

The planning team collects ideas from user group representatives.

- **Historical Societies**

  - **Introductory Meeting:** This stakeholder meeting was held on November 6, 2012.

  - Carnegie SVRA staff members attended the following meetings and provided short updates on the General Plan:

    - **Livermore Heritage Guild**—April 15, 2011

    - **Tri-Valley History Council—**August 23 and November 15, 2011; February 21, May 22, August 21, and November 14, 2012

    - **Livermore-Amador Genealogical Society**—November 27, 2012

TOURS OF THE PLANNING AREA

Table 1-3 provides a list of the tours provided by Carnegie SVRA staff members to stakeholders in 2012 and 2013 in association with General Plan development. Staff members drove attendees in State Parks vehicles. At strategic locations, the vehicles were stopped and attendees were able to get out and listen as staff members spoke about the site's resources and history. A very broad spectrum of stakeholders was invited; however, only a small percentage of those invited took advantage of the tours.

PUBLIC INVOLVEMENT

State Parks puts a high priority on involving the public in planning the future use and management of park units. For this reason, the planning team reached out in a variety of ways to inform, involve, collaborate with, and educate the public. The planning team held public meetings, posted information and activities on a project website, mailed notices to interested parties, invited parties to provide comments, and attended events to alert visitors and OHV recreationists from other SVRAs about the Carnegie SVRA General Plan. Public notices of the scoping meeting were placed in the *Livermore Independent* (May 10, 2012), the *Modesto Bee* (May 13, 2012), the *Tracy Press* (May 11, 2012), and the *Tri-Valley Herald* (May 13, 2012).

Table 1-3. Carnegie SVRA General Plan Site Tours

Date	Stakeholder Groups	State Parks Staff	Number Attended
February 21, 2012	Tri-Valley History Council	Elise McFarland, Interpreter	~20
March 10–11, 2012	Tracy Westside Pioneers	Elise McFarland, Interpreter	~20
April 23, 2012	California Native Plant Society	Elise McFarland, Interpreter	18
May 11, 2012	East Bay Regional Park District Board	Elise McFarland, Interpreter	~20
May 23, 2012	Equestrians	Elise McFarland, Interpreter	10
May 25, 2012	East Bay Regional Park District interagency planning team	Elise McFarland, Interpreter	2
July 12, 2012	CDFW, USFWS	Elise McFarland, Interpreter; Clint Elsholz, Environmental Scientist	2
September 18, 2012	CORVA	Elise McFarland, Interpreter	2
December 13, 2012	CDFW, USFWS, and Central Valley RWQCB	Elise McFarland, Interpreter; Clint Elsholz, Environmental Scientist	3
January 7, 2013	Rider/user groups and SVRA concessionaire[1]	Elise McFarland, Interpreter	13
April 9, 2013	Few people attended. Groups invited are listed in the footnote below [2]	Elise McFarland, Interpreter; Clint Elsholz, Environmental Scientist	5
October 2, 2013	Sierra Club	Elise McFarland, Interpreter; Clint Elsholz, Environmental Scientist	~20

Notes: CDFW = California Department of Fish and Wildlife; CORVA = California Off-Road Vehicle Association; RWQCB = Regional Water Quality Control Board; SVRA = State Vehicular Recreation Area; USFWS = U.S. Fish and Wildlife Service

[1] Representatives were invited from the following groups: California Association of 4WD Clubs, Carnegie SVRA concessionaire, Wandering Wheelers, Blue Ribbon Coalition, Carnegie Forever, Diablo 4 Wheelers, Cycle Specialties, California Enduro Riders Association, Dave's Adventures, and Diablo Off Road Association.

[2] Representatives were invited from the following groups: Alameda County, ATC Dual Sport, Bay Over the Hill Gang, Berkeley Bionics, Blue Ribbon Coalition, CDFW, California Association of 4WD Clubs, California Enduro Riders Association, CORVA, California Department of Transportation, Carnegie Forever, Marin County Motorcycle Association, Center for Biological Diversity, Central Valley RWQCB, City of Livermore, Cycle Specialties, Dave's Adventures, Deep in Debt Motorsports, Diablo 4 Wheelers, Diablo Off Road Association, District 36 Motorcycle Sports Committee, East Bay California Native Plant Society, East Bay HI Tailers, East Bay Motor Sports, East Bay Regional Park District, California State University East Bay, Escarabajo Buggy Club, Gallo, Golden Gate Audubon Society, Greenbelt Alliance, Hetch Hetchy Water and Power, Honda Kawasaki of Modesto, Hummer X Club NorCal, Livermore Chamber of Commerce, Livermore Heritage Guild, Lawrence Livermore National Laboratory Experimental Test Site (Site 300), McDermott Ranch, MotoMart at Carnegie, Oakland Motorcycle Club, Ohlone Audubon Society, Ohlone/Costanoan tribe, Bay Miwok tribe, Plains Miwok tribe, Patwin tribe, Northern Valley Yokuts tribe, Richmond Police Department Police Activities League, Sierra Club (San Francisco and Tri-Valley), Skip's Promotions, SRI International, Swaim Biological Consulting, Tracy Chamber of Commerce, Tracy Motorsports, USFWS, Wandering Wheelers, West Coast ATV Riders Association, and WT 4 Wheelers.

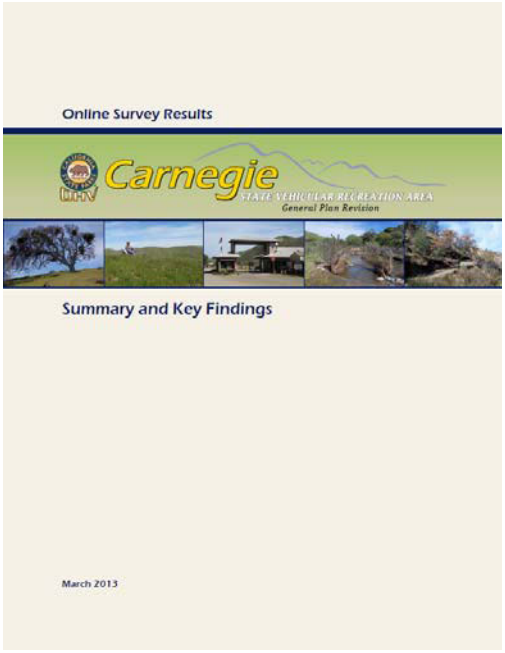
Project Website

A website (www.CarnegieGeneralPlan.com) was specifically created for the planning effort and served as the main portal for all communication about the General Plan. This website contained information about the planning process, links to background reports and documents, a comment form, a mailing list signup form, announcements of upcoming meetings, and answers to frequently asked questions. In addition, all materials used during public meetings (e.g., PowerPoint presentations, graphics, handouts) were posted and presented on the website to allow those unable to attend the meeting in person to review and comment. The preliminary General Plan/draft EIR (DEIR) and draft General Plan/final EIR (FEIR) and materials related to the OHMVR Commission hearing on the General Plan and EIR will also be posted on this website, when available.

A project website was maintained during the General Plan process: www.CarnegieGeneralPlan.com

Online Survey

The planning team conducted an online survey available to anyone who visited the General Plan website between May 22 and October 12, 2012. Survey participation was solicited and encouraged through direct e-mail invites, extended to visitors and stakeholders in person, and provided on a fact sheet and on the website. A total of 934 individuals participated in the survey, which consisted of a series of 15 questions. The questions fell into three categories: demographics of the respondents and their companions, visitor experiences, and possible improvements to the visitor experience at Carnegie SVRA. A summary of the survey results posted on the website in March 2013 is available at www.CarnegieGeneralPlan.com/document-library.



A survey summary was posted to the project website in March 2013.

Public Workshops

Scoping/Public Workshop 1

The first public workshop for the Carnegie SVRA General Plan and EIR was held at the Livermore Doubletree Hotel on May 21, 2012, 6:30 p.m. to 8:00 p.m. It drew approximately 120 attendees.

During the public workshop, the Carnegie SVRA General Plan team held a presentation on the process for developing a general plan and EIR for a State Park unit. Additional materials presented at the open house–style meeting included poster boards on the topics of natural and cultural resources, park operations, visitor experience, and the planning process. The planning team provided information and answered meeting attendees' questions. Attendees were encouraged to provide their input, suggestions, and concerns about the contents of the Carnegie SVRA General Plan and the environmental effects of implementing the plan.

Attendees at the first public workshop were able to browse available information and ask questions of the planning team.

Concept Alternatives Workshop

The second public workshop was held at Tracy High School on June 10, 2013, from 6:00 p.m. to 8:30 p.m. More than 200 people attended to review the three concepts and talk to staff members and the planning team. An online public workshop was conducted June 11–July 15, 2013. The planning team received more than 450 responses from the workshop activities and more than 500 letters, e-mails, and comments through the website. In the online workshop, participants could review the materials and provide feedback on each stage of the presentation.

An attendee reviews the concept alternatives at the June 10, 2013, public workshop.

Preferred Concept Workshop

The planning team hosted two public workshops and an online activity to present the preferred concept. The first workshop was held at Amador Valley High School on November 12, 2013, from 7:30 p.m. to 9:00 p.m. Close to 350 people attended. The planning team set up a booth near the MotoMart on November 16, 2013, from 1:00 p.m. to 3:00 p.m. The website hosted an online activity that provided the same information that was present at the in-person workshops. The activity was available to the public from November 13 to December 13, 2013. The planning team received approximately 1,210 comments.


Carnegie
STATE VEHICULAR RECREATION AREA
General Plan Revision
Fact Sheet 2
October 2012
Update on the General Plan
Representatives of California State Parks met with the public in May for a workshop and environmental impact report (EIR) scoping meeting to kick off the planning process for Carnegie State Vehicular Recreation Area (SVRA). This was the beginning of the multi-year process to replace the 1981 General Plan with a new General Plan based on today's science, conditions, and public input. The new General Plan will include guidance for uses and management of the existing SVRA as well as the Alameda-Tesla expansion area.
Since the public meeting in May, the planning team has been working on a variety of activities, including:
Collecting and analyzing comments
Conducting an online survey
Posting and updating answers on the website to frequently asked questions
Meeting with agency staff to discuss their input on the General Plan and potential environmental impacts
Continuing conversations with stakeholder groups
Updating biological surveys
Reviewing information about cultural and historic resources on site
Counting traffic coming to, and going by, the SVRA
Public Input
Thanks to everyone who made it to the May 21, 2012 public workshop and EIR scoping meeting. There was a great turnout with about 120 engaged attendees, many of whom provided comments at the meeting. Over 230 people have since provided comments using the website. Many more have emailed the planning team directly at carnegiegp@parks.ca.gov, and close to 900 people have taken the survey available on the project website, www.CarnegieGeneralPlan.com.
Some of the initial input includes:
Open the Alameda-Tesla expansion area for off-highway vehicle (OHV) use
Do not open the expansion area for any use
Allow both off-highway motor vehicle recreation and non-motorized recreation in the expansion area
Add more tracks and trails for 4-wheel drive vehicles, dirt bikes, ATVs, and side-by-sides
Protect the sensitive biological species and habitats that may be present within the planning area
Protect the historic resources and make them available for educational programs
All of the comments provided to the planning team are being read, analyzed, and compiled to use in creating a few draft ideas (alternatives) for future uses and management of the SVRA. Along with the comments, the planning team is using other input to help with creating these draft alternatives, including cultural and biological resource information, input from outside agencies, input from stakeholder groups, and other current condition information.
The online survey will be available through October 12, 2012.
Livermore
Tracy
Tesla Road
Alameda-Tesla Expansion Area
Corral Hollow Road
Carnegie SVRA
OFF-HIGHWAY MOTOR VEHICLE RECREATION DIVISION CALIFORNIA STATE PARKS

Fact Sheet 2 provided an update on the General Plan process.

Visitor Appreciation Day Workshop

The planning team hosted a public workshop to provide the latest project updates and distribute Fact Sheet 3. The

workshop was held at Carnegie SVRA during Visitor Appreciation Day on Sunday, October 19, 2014. The planning team was available from 9:00 a.m. to 2:00 p.m. and approximately 15 people visited the General Plan booth.

Fact Sheets

Fact Sheet 1—Introduction to the General Plan

The first fact sheet was provided to SVRA visitors beginning in April 2012 to alert them to the start of the Carnegie SVRA General Plan process and invite them to the first public workshop. The fact sheet was handed out for about a month to everyone who came through the SVRA's gates.

Fact Sheet 2—Update on the General Plan

In October 2012, the planning team provided an update to the public, using the second fact sheet. The fact sheet listed ongoing activities, summarized public input, and identified the factors to be considered by the planning team when developing the draft concepts.

Fact Sheet 3—Update on the General Plan

In October 2014, the planning team provided an update to the public, using the third fact sheet. The fact sheet provided background information about the preliminary General Plan and DEIR preparation, and included an update on the status of the documents.

Fact Sheet 4—Preliminary General Plan and DEIR

The fourth fact sheet will announce the public comment period for the preliminary General Plan and DEIR, and will include information about the preferred alternative and important findings of the DEIR.

Fact Sheet 5—Draft General Plan and FEIR

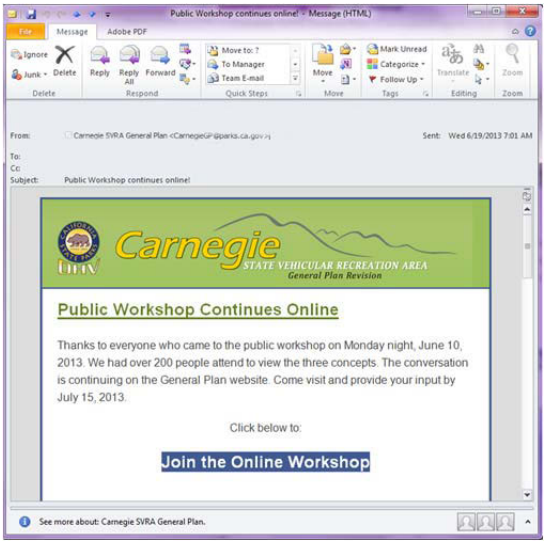
The fifth fact sheet will provide an update on the draft General Plan and FEIR, and will announce the OHMVR Commission hearing for approval of the General Plan revision by the commission and certification of the EIR by the OHMVR Division.

Alerts/Notifications

E-mail Blast

At important points throughout the process, the planning team sent e-mails to the contact list. The following e-mail blasts were sent during the planning process for the Carnegie SVRA General Plan:

- *Website Goes Live, April 12, 2012*—Sent to 112 e-mail addresses, this blast announced that the General Plan website was live and available to the public.



E-mail blasts were sent to the stakeholder list to announce special events or activities.

- *Notice of Preparation, May 11, 2012*—Sent to 200 e-mail addresses, this blast announced the public comment period for the notice of preparation as well as the first public meeting.
- *Fact Sheet 2 and Update on the General Plan, November 5, 2012*—Sent to 1,284 e-mail addresses, this blast provided a link to the second fact sheet and the summary of public comments.
- *Invitation to a Public Workshop, May 10, 2013*—Sent to 1,383 e-mail addresses, this blast provided the date, time, and location of the second public workshop.
- *Public Workshop Continues Online, June 19, 2013*—Sent to 1,520 e-mail addresses, this blast announced the details of the Web activity related to the second public workshop.
- *Thank You!, August 2, 2013*—Sent to 1,594 e-mail addresses, this blast thanked those who had participated in the online and in-person workshop and provided the approximate numbers of comments received.
- *Preferred Concept Workshop!, October 14, 2013*—Sent to 1,826 e-mail addresses, this blast provided dates, times, and locations for learning about and commenting on the preferred concept. This blast was re-sent as a reminder to 1,842 e-mail addresses on November 5, 2013.
- *Thank You and Don't Forget This Saturday's Event!, November 14, 2013*—Sent to 1,952 e-mail addresses, this blast thanked those who attended the evening workshop and reminded recipients that the planning team would be at the SVRA that Saturday.
- *Project Schedule Update, March 28, 2014*—Sent to 1,906 e-mail addresses, this blast provided an update on the project schedule, and directed recipients to the project website.
- *Fact Sheet 3 and Visitor Appreciation Day, October 19, 2014*—Sent to 1,956 e-mail addresses, this blast announced Visitor Appreciation Day and invited

A flyer was posted at Carnegie SVRA before the third public workshop.

The planning team handed out thousands of postcards to announce that the General Plan process had started and obtain contact information.

recipients to stop by the General Plan booth for the latest project updates and Fact Sheet 3. A link to Fact Sheet 3 was also provided.

- *General Plan Update, December 18, 2014*—Sent to 1,912 e-mail addresses, this blast informed recipients that the Administrative Draft Preliminary General Plan and DEIR has been submitted to the California State Parks OHMVR Division for review.

Additional blasts will be sent to announce other events of interest to the public and stakeholders such as the public release of the preliminary General Plan/DEIR, the availability of the draft General Plan/FEIR, and the OHMVR Commission hearing to approve the General Plan and the OHVMR Division to certify the EIR.

Flyer

Before the third workshop, the planning team posted a flyer at Carnegie SVRA. The flyer provided dates, times, and locations for learning about and commenting on the preferred concept.

Postcard Invitation

At the outset of the Carnegie SVRA General Plan process, the planning team passed out a postcard that included a place to list contact information so the recipient could mail the postcard back to the planning team. The postcard also contained a tear-off card containing the website's address. The postcard was distributed to occupants of every vehicle coming through the SVRA gates, to event attendees, and to local vendors for distribution to their customers.

Postcard Announcement for the Concept Alternatives Workshop

About 10 days before the second public workshop, the planning team mailed a postcard to 72 stakeholders who had provided mailing addresses and did not provide e-mail addresses. This postcard provided a description, location, time, and date for the second public workshop.

Postcard Announcement for the Preferred Concept Workshop

About 3 weeks before the third public workshop, the planning team mailed a postcard to 112 stakeholders who had provided mailing addresses and did not provide e-mail addresses. This postcard provided a description, location, time, and date for the third public workshop.

CHAPTER 2 – EXISTING CONDITIONS

Visitors putting on their gear before a ride

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 15 miles east of Livermore and 12 miles southwest of Tracy (Figure 1-1). To the north is the Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) property. Open space and ranches and rural residences are located to the east, west, and south. The expansion area is located immediately west of the original Carnegie SVRA and is currently not open to the public. The expansion area was most recently used for cattle grazing (Figure 2-1).

Large ranches are located to the north, west, and south of the expansion area. The *Alameda County General Plan* designates the lands surrounding the planning area to the north, west, and south as Agricultural/Grazing. Because of the ephemeral nature of Corral Hollow Creek, the neighboring ranchers have constructed stock ponds throughout the watershed to supplement the water supply during the summer months. Ranchers also have constructed a single spring-fed trough west of the Tesla Coal Mine Site (State Parks 2007a:36–38). 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 2011a: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, operates an explosives testing facility southeast of Carnegie SVRA. SRI is an independent, nonprofit research institute that conducts client-sponsored research and development projects for government agencies, commercial businesses, foundations, and other organizations. The facility is accessed via SRI Road, a paved road on an easement that runs through the active riding areas of the SVRA. The road starts at the

entrance to Kiln Canyon Trail and runs along the eastern boundary of the Kiln Canyon subwatershed, terminating at the testing facility. Although the road traverses an active riding area, it is gated and fenced off and is not accessible to riders (State Parks 2007a:39, 2011a:5–6).

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's 8,000 employees work in the facility's engineering, maintenance, waste management, security, environmental protection, fire, health and safety, and medical departments.


View of Mitchell Ravine

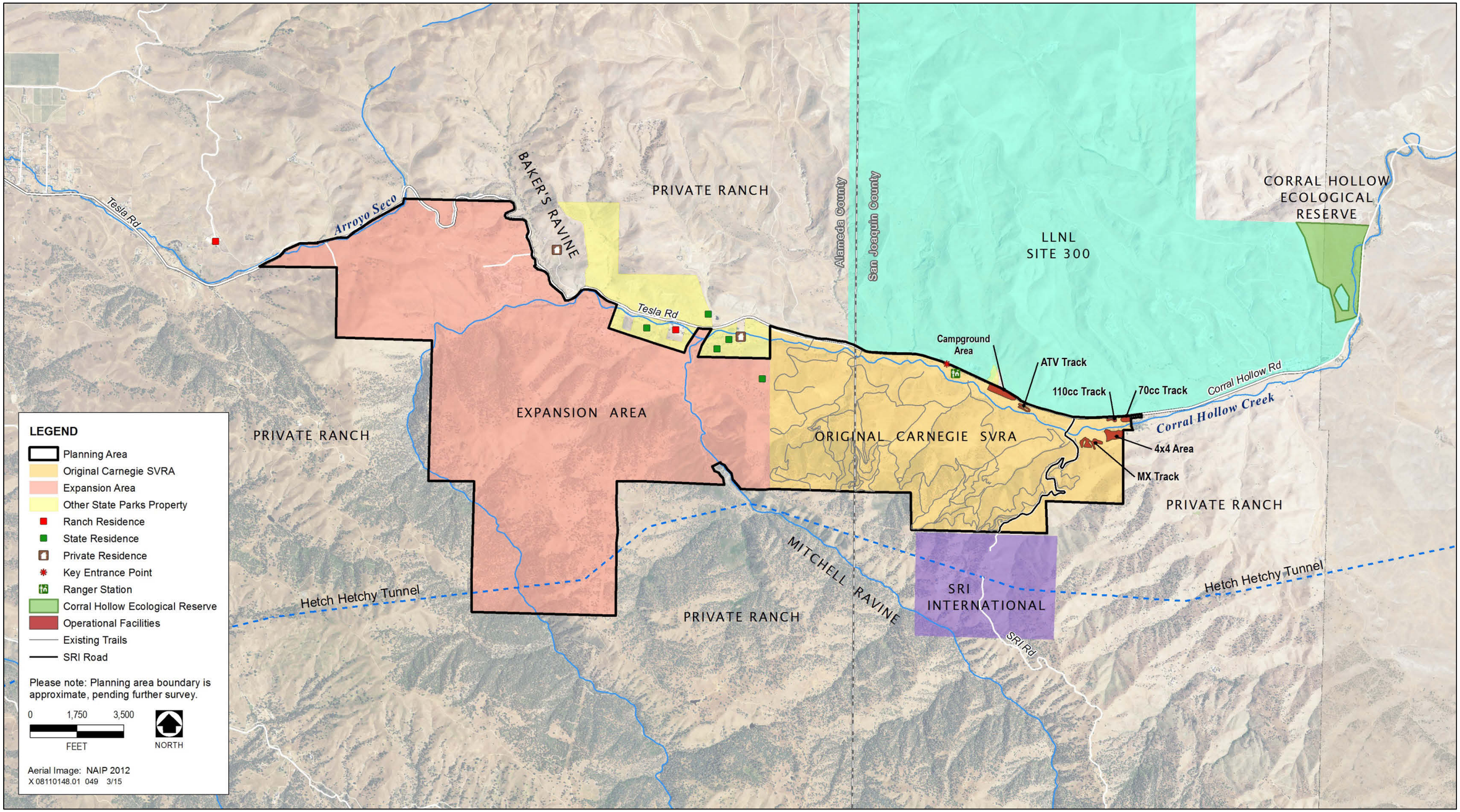
State Parks owns several single-family residential dwellings located along Corral Hollow Creek between Mitchell Ravine and the Tesla Coal Mine Site. Some of those serve as residences for State Parks employees. A small private residential area containing single-family dwellings and a small rodeo arena is also located along Corral Hollow Creek near Mitchell Ravine. A few houses located in the upper portion of the Corral Hollow watershed belong to private ranchers (State Parks 2007a:36–38, 2011a:5) (see Figure 2-1).

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 tunnel passes beneath the upper reaches of Mitchell Ravine, a southern tributary to Corral Hollow Creek. 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 2011a:6).

2.1.2 Regional Recreation Facilities


Family recreating together at Carnegie SVRA

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. Several high-quality public natural areas exist in the region that are used for nature study and passive recreation. Carnegie SVRA is not frequently used for nature oriented recreation; however, opportunities for improved education and interpretation of natural and cultural resources exist at the SVRA.



Sources: Data provided by State Parks in 2012 and U.S. Geological Survey in 2013; data compiled by AECOM in 2013

Figure 2-1. Surrounding Land Uses

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.

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. Other parks that fall under NPS jurisdiction are the Eugene O'Neill National Historic Site in Danville and the John Muir National Historic Site in Martinez. NPS also manages the Golden Gate National Recreation Area, which consists of an extensive network of historic and natural areas and is the largest concentration of federal natural areas in the San Francisco Bay Area. Common activities in these areas include hiking, camping, and water recreation. None of the nearby federal preserves or recreation areas provide OHV recreation.

STATE PARKS

Several state parks are located within 30 miles of Carnegie SVRA: Durham Ferry State Recreation Area, Caswell Memorial State Park, Bethany Reservoir State Recreation Area, and the large Lake Del Valle State Recreation Area (operated by East Bay Regional Park District [EBRPD]), which consists of a network of smaller regional recreation and wildlife areas. The closest SVRAs are Hollister Hills SVRA, approximately 100 miles to the south, and Prairie City SVRA, about 90 miles to the north.

REGIONAL PARKS

EBRPD manages an extensive network of regional parks, preserves, and recreation areas in Alameda and Contra Costa Counties. The district's 65 parks and more than 114,000 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. The closest EBRPD lands are Brushy Peak Regional Preserve and Del Valle Regional Park (Lake Del Valle State Recreation Area). Brushy Peak Regional Preserve is located approximately 13 miles northwest of Carnegie SVRA and includes 1,833 acres available for hiking, biking, running, nature study, or dog walking. Del Valle Regional Park is located about 8 miles southwest of the SVRA and includes 4,395 acres of land and a lake with activities ranging from swimming, windsurfing, and boating to hiking, horseback riding, and nature study. Within Del Valle Regional Park is Camp Arroyo, a residential camp that serves children year round (EBRPD 2013).

COUNTY PARKS

San Joaquin County has several regional parks, located primarily in Lodi and Stockton (Dos Reis, Oak Grove, and Westgate Landing Regional Parks), that provide access to the Mokelumne and San Joaquin Rivers for fishing and water recreation. No OHV opportunities are available in the San Joaquin County Parks System. Alameda County does not have a separate park system outside of EBRPD.

Santa Clara County manages 28 parks and more than 45,000 acres of land providing extensive hiking and equestrian trails, among other amenities. The county also manages the 459-acre Santa Clara Motorcycle Park, located approximately 60 miles southwest of Tracy, which serves primarily residents of San Jose with 20 miles of dirt trails, motocross tracks, picnic areas, and other amenities.

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.

CITY PARKS

The City of Tracy has 72 parks covering just over 263 acres. Recreation opportunities include playgrounds, ball courts, walking paths, picnic and BBQ areas, and more. The City of Livermore has more than 30 parks at the community, neighborhood, and regional scales that offer a wide array of activities. There are no OHV parks in Tracy and Livermore.

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 contains approximately 4,675 acres: 1,575 acres in the original Carnegie SVRA and 3,100 acres in the expansion area. The original Carnegie SVRA offers more than 1,300 acres of OHV recreation on rolling hills and in steep, rugged canyons. Recreation uses within the original Carnegie 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. The expansion area has historically been grazed, although grazing depends on the availability of forage. Other land uses in the expansion area are related to the easements in the area, such as the Hetch Hetchy tunnel and the power lines traversing the area.

2.2.2 CIRCULATION AND ACCESS

The Carnegie SVRA ranger station is located just inside the main entrance, along with a first-aid facility, office, and parking. 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).

Automobile 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. Personal 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

Visitors enter the SVRA from Corral Hollow Road

A 2012 traffic study revealed 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 Interstate 580 (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).

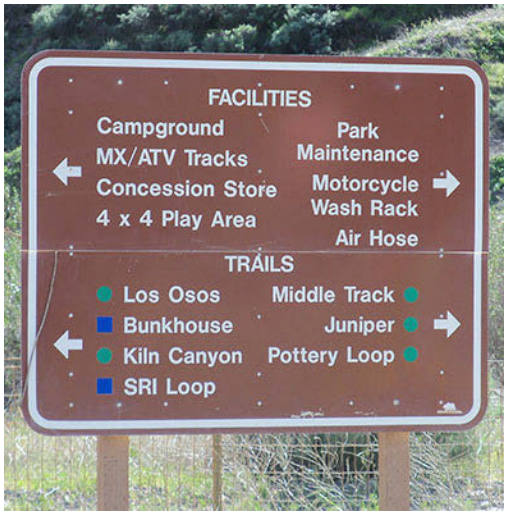
No alternative modes of transportation, such as bus, rail, bicycle, or pedestrian facilities, are available in the area. Because OHVs, with the exception of highway-licensed trucks, jeeps, and dual-sport motorcycles, are typically transported to recreational areas by a highway-licensed vehicle, the use 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 recently began a safety study of Tesla Road between Livermore and the San Joaquin County line. This study is intended to identify and recommend potential future safety improvements to the roadway, but no widening or capacity improvements are under consideration.

2.2.3 FACILITIES

VISITOR FACILITIES

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



Sign listing the facilities at Carnegie SVRA

- *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 (23 sites). Each site has 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.

Rider beginning ascent during a hillclimb competition

ADMINISTRATION AND MAINTENANCE FACILITIES

The Carnegie Sector office is located in a house left over from when the expansion area was used as a ranch

Existing administration and maintenance facilities include an entrance station, the maintenance yard, and the Carnegie Sector 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 Sector office is located in an old ranch house and contains a team meeting space, shared kitchen, and offices for administrative support personnel, the SVRA interpreter, an environmental scientist, two park facility and resource supervisors, and the sector superintendent.

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 across the expansion 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. PG&E owns a 200-foot "perpetual and exclusive" easement along the line. Before any earth-disturbing or construction activities begin within the easement, plans must be submitted to PG&E's Stockton Land Department and Transmission Line Department for review and approval (State Parks 2007a:38).

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 due west through the expansion area. 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 that are 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.

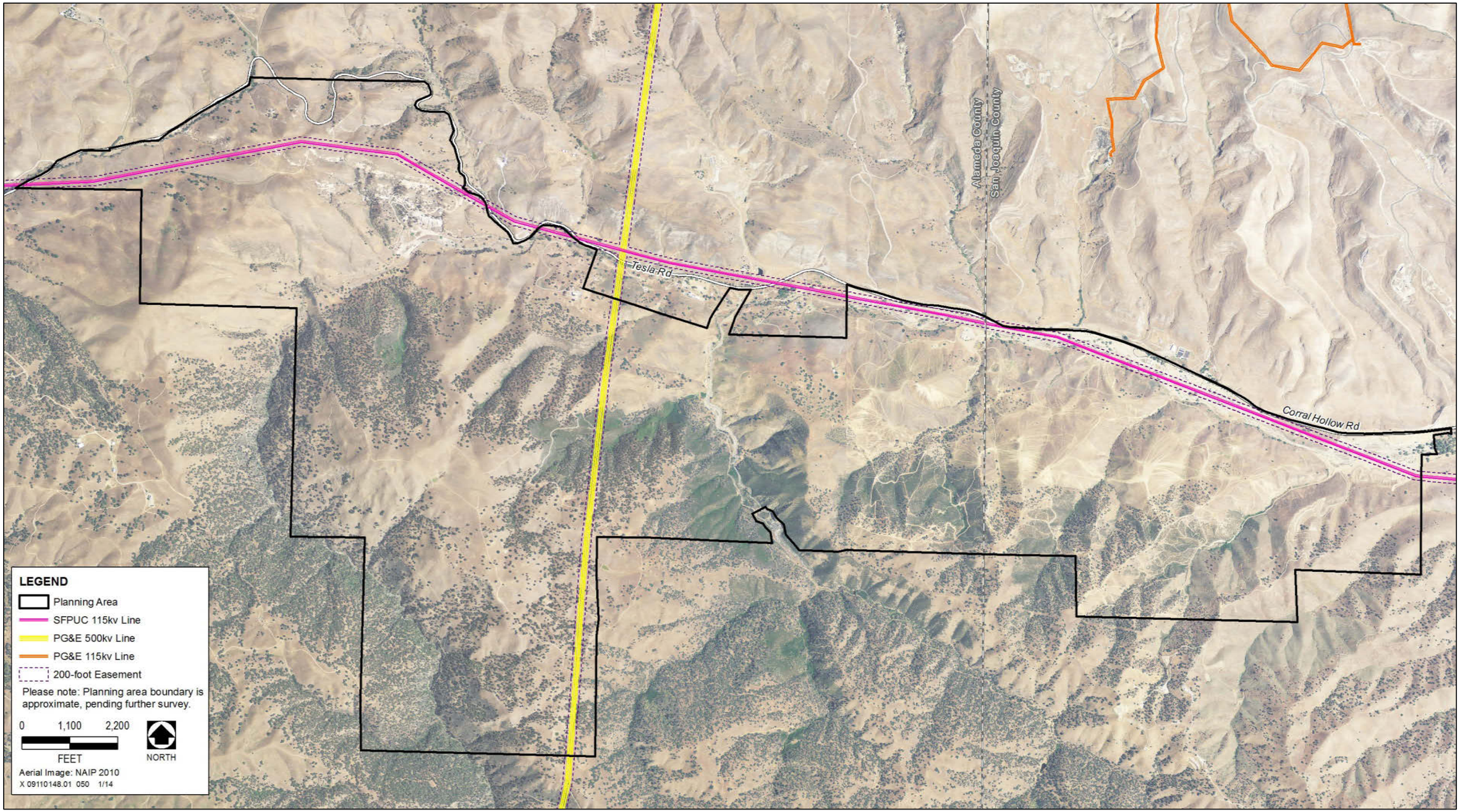
TELECOMMUNICATIONS

An underground AT&T cable parallels SRI Road. The cable supplies SRI 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 on State Parks–owned land north of Corral Hollow Road (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 nonpotable 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.



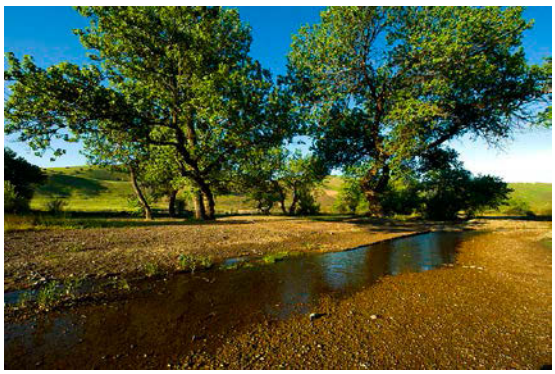
Sources: State Parks and CEC 2011 data, adapted by AECOM in 2013

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

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 the OHMVR Division, Carnegie SVRA staff members, and community stakeholders with an understanding of historical occurrences that have shaped the watershed. Based on the assessment's findings, the OHMVR Division 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, the OHMVR Division 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; application of dust suppressants; removal of accumulated sediment from sediment basins and culverts; and construction of low-water crossings and bridges. The OHMVR Division 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. Plans have been prepared for improved sediment ponds at the mouths of Tyson's, Carrol, and Kiln Canyons. The intent of implementing these recommendations is to ensure that the lands managed by the OHMVR Division 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. Carnegie SVRA staff members implement the *Storm Water Management Plan for Carnegie SVRA* (SWMP) (State Parks 2011a). 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."



Corral Hollow Creek flows intermittently during rainy winter months

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 2055.

2.3 SIGNIFICANT RESOURCE VALUES

2.3.1 PHYSICAL RESOURCES

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 2,260 feet above mean sea level in the western portion of the expansion area (south of Tesla Road). 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

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) Altamont, Cedar Mountain, and Midway 7.5-minute quadrangles. As described previously in the "Topography" section, the area's topography ranges from approximately 600 to 2,260 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:

- 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.

Table 2-1. Abbreviated Geologic Time Scale

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

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. In the expansion area, these deposits are located only along Corral Hollow Creek.

- **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. A portion of the Greenville Fault touches the western portion of the expansion area (Figure 2-3) and is located in an Alquist-Priolo Earthquake Fault Zone (California Geological Survey 1982).

Seismic Ground Shaking

Ground shaking, motion that occurs as energy is released during faulting, 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

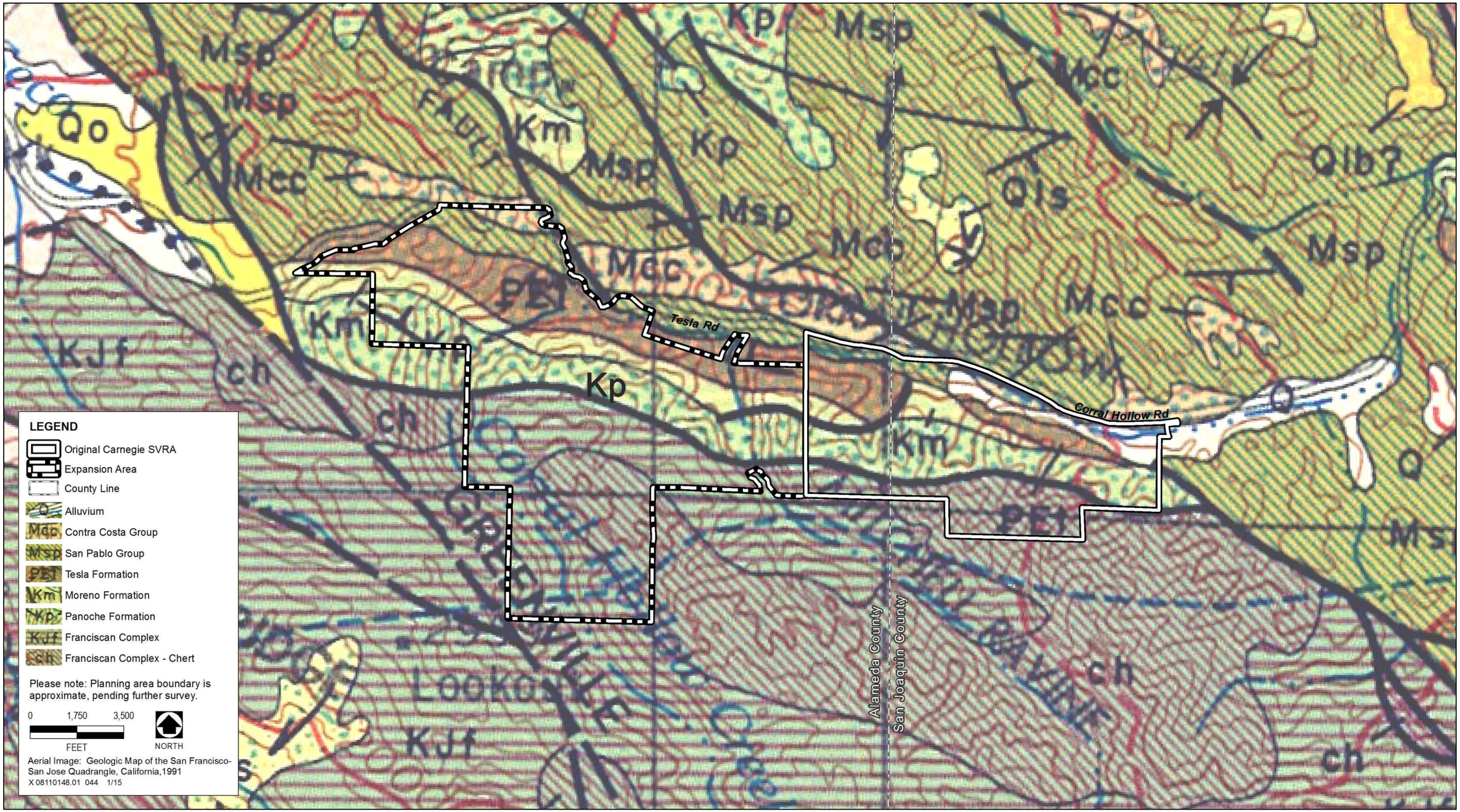
Seven major active faults extend through the San Francisco Bay region in a northwesterly direction and have produced at least 12 large-magnitude (greater than 6.0) earthquakes in the last 200 years. The faults on which these earthquakes occurred are part of a fault system located along the boundary of 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, touches the western portion of the expansion 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.

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 2-4 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 3.6 miles northwest of the expansion 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 planning area, 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. No geologic evidence exists to suggest that fault activity has occurred since the Pleistocene epoch. Therefore, this fault is not considered active.



Source: Wagner et al. 1991

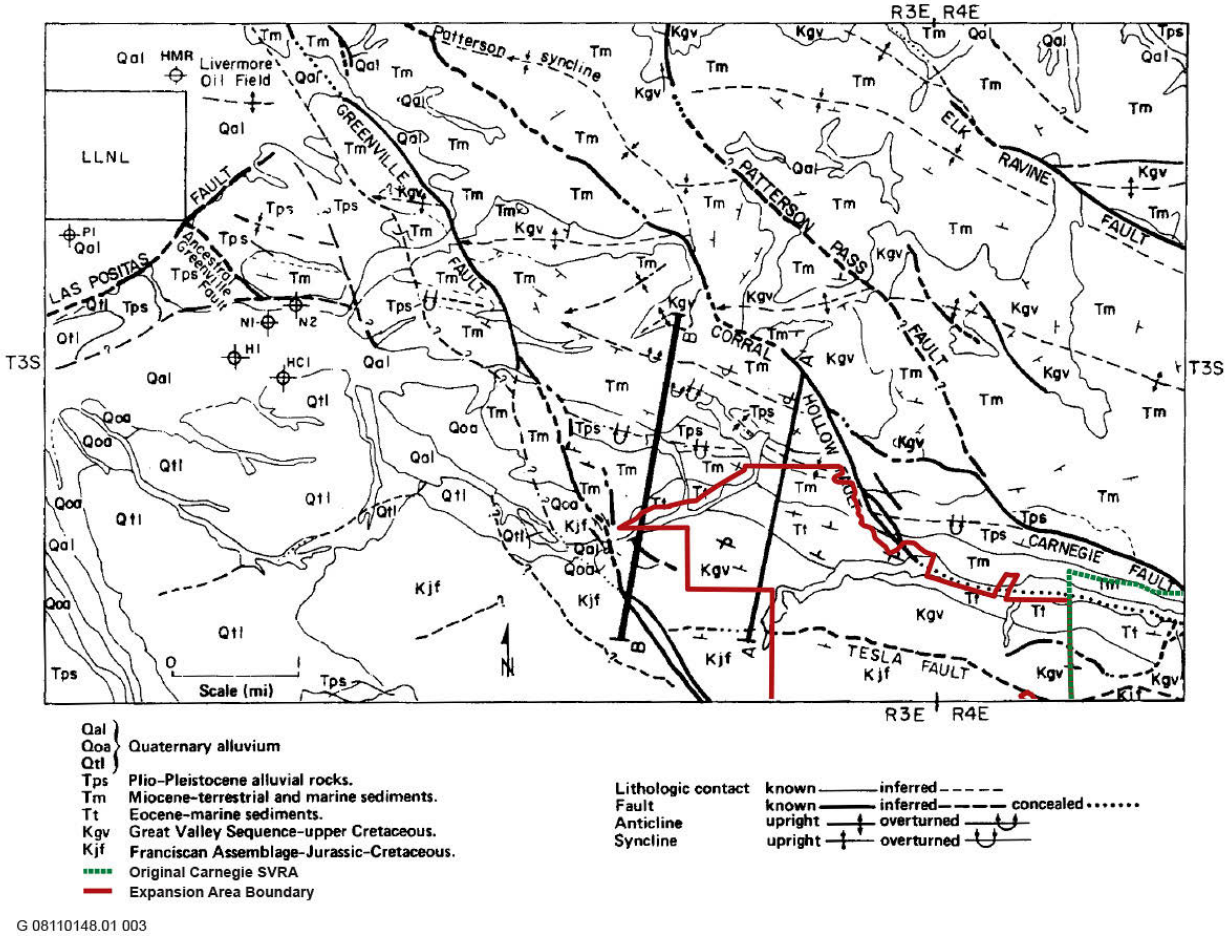
Figure 2-3. Geologic Formations in the Planning Area

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	0	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	15	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	20	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



Source: Carpenter et al. 1984

Figure 2-4. Faults in the Planning Area Vicinity

- **Tesla Fault**—A portion of the Tesla Fault is located within the expansion area 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 just west of the expansion 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**—A portion of the Carnegie Fault is located within the actively used portion of Carnegie 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. No geologic evidence exists to suggest that fault activity has occurred since the Pliocene epoch. Therefore, the Carnegie Fault is not considered active.

- **Patterson Pass Fault**—The Patterson Pass Fault branches from the Carnegie Fault just north of the expansion 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 planning area are shown in Figure 2-5.

The portion of the expansion area located south of the Tesla Fault consists of the Franciscan Complex Mélange, a sheared mixture of primarily siltstone and shales. Because of the sheared composition of the Franciscan Complex, its slope stability generally ranges from very low to moderate (Cotton 1972). Cotton identified four large landslides in the southern portion of the expansion area, which are thought to be ancient and deep-seated. Nilsen (1972) also conducted a landslide analysis by analyzing aerial photographs. The results of Nilsen's analysis indicated that more than 50 percent of the expansion area and approximately 30 percent of the original Carnegie SVRA consists of small to large landslides. 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, intensity and duration of seismic ground motions, type and consistency of soils, and depth to groundwater. Loose sands, peat deposits, and uncompacted fill and other Holocene deposits are more susceptible to liquefaction. Clayey silts, silty clays, clays deposited in freshwater environments, and deposits that are older than 11,700 years B.P. are more stable under the influence of seismic ground shaking.

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.

As discussed above, several active faults are present either within or close to the expansion area. However, except for Holocene-age alluvium (recent stream deposits found along the bed of Corral Hollow Creek),

all formations in the expansion area mapped by Wagner et al. (1991) consist of older sedimentary and metamorphic rocks that would not be expected to liquefy during an earthquake.

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.

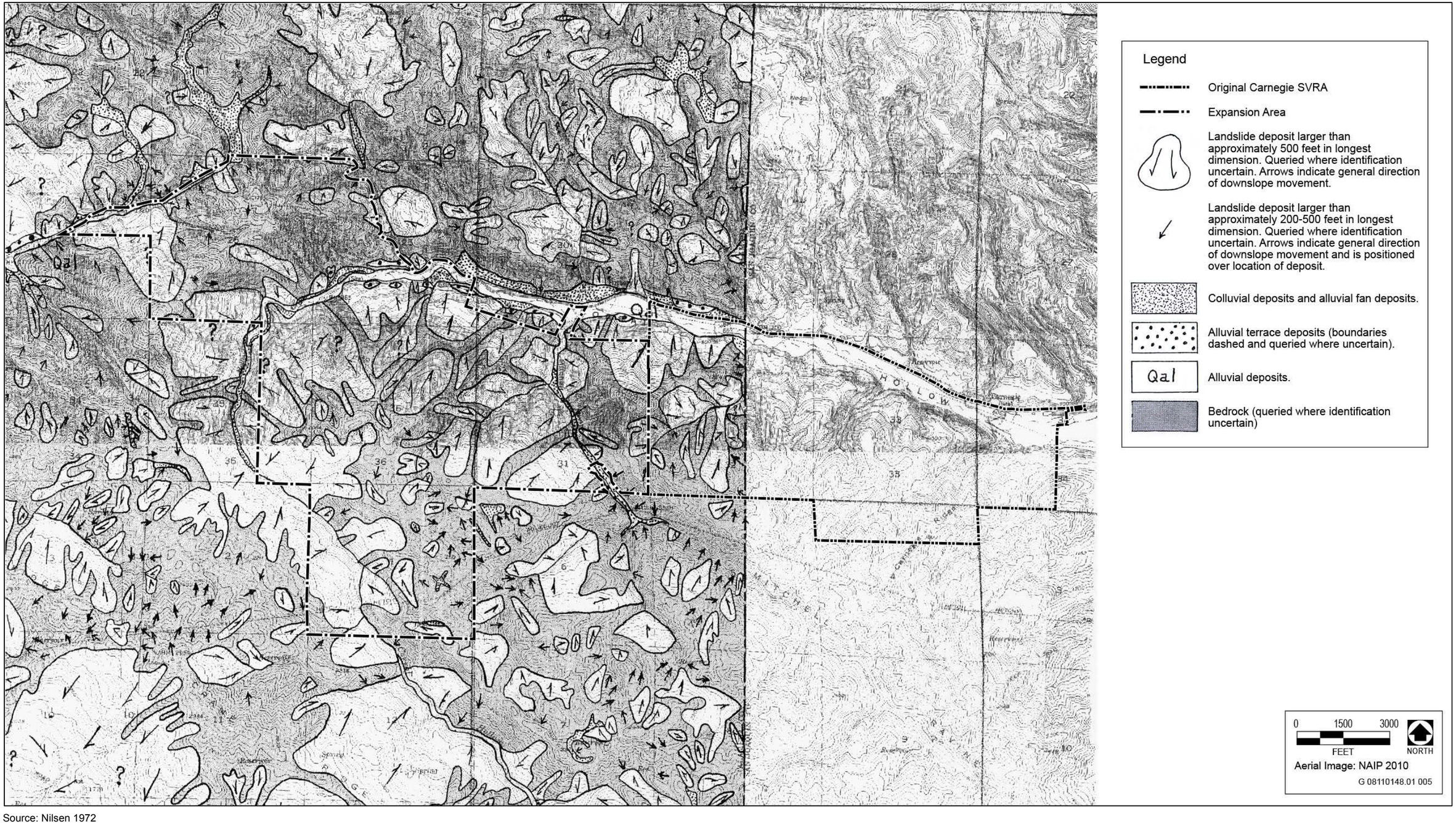
Soils

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

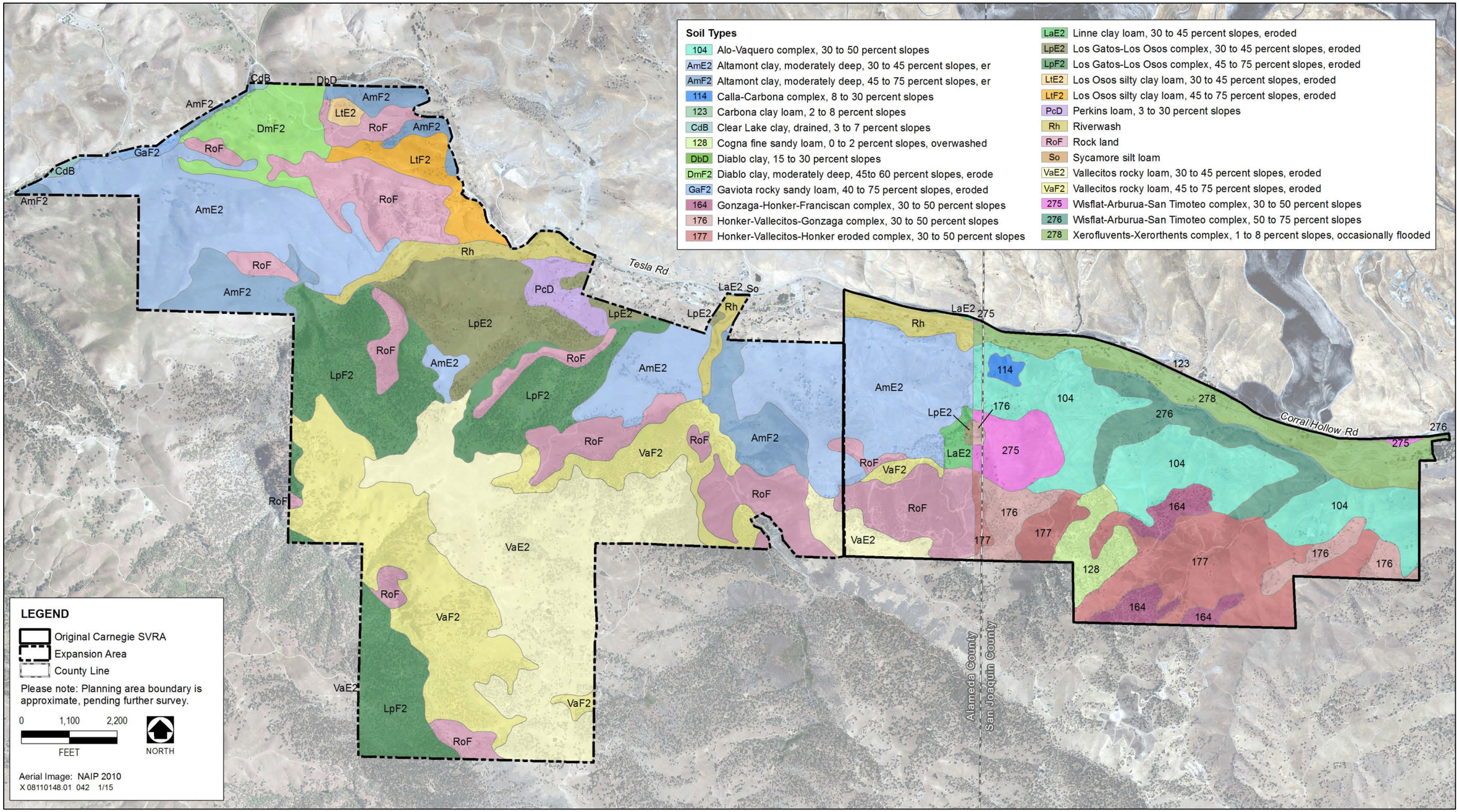
As shown in Table 2-3, data from soil surveys conducted by the U.S. Natural Resources Conservation Service (NRCS) (USDA 2006, cited [as USDA 2006b] in State Parks 2007a) indicate that most soils in the planning area have relatively low susceptibility to wind erosion, but also have high runoff rates and 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 and the expansion area. 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.



Source: Nilsen 1972

Figure 2-5. Landslides in the Planning Area



Source: State Parks 2007a, based on U.S. Natural Resources Conservation Service soil survey data

Figure 2-6. Soil Types in the Planning Area

Table 2-3. Characteristics of Soil Types in 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
Soils in the Expansion Area										
Altamont clay, moderately deep, 30–40% slopes, eroded	Clay	18–36	Well drained	Very low	D	Very high	High	7	Severe	Very limited
Altamont clay, moderately deep, 45–75% slopes, eroded	Clay	18–30	Well drained	Very low	D	Very high	High	7	Very severe	Very limited
Clear Lake clay	Clay	NA	Moderately well drained	Moderately low	D	Very high	High	7	Slight	Very limited
Diablo clay, 15–30% slopes	Clay	50–54	Well drained	Very low	D	Very high	High	7	Moderate	Very limited
Diablo Clay, moderately deep, 45–60% slopes, eroded	Clay	30–40	Well drained	Very low	D	Very high	High	7	Very severe	Very limited
Gaviota rocky sandy loam, 40–75% slopes, eroded	Sandy loam	NA	Excessively drained	High	B	NA	Low	3	Very severe	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
Los Gatos–Los Osos Complex, 45–75% slopes, eroded	Loam	12–48	Somewhat excessively drained	Very low	C	High	Moderate	8	Very severe	Very limited
Los Osos silty clay loam, 30–45% slopes, eroded	Silty clay loam	18–48	Well drained	Very low	C	High	Moderate	7	Severe	Very limited
Los Osos silty clay loam, 45–75% slopes, eroded	Silty clay loam	18–48	Somewhat excessively drained	Very low	C	High	Moderate	7	Very severe	Very limited
Perkins loam, 3–30% slopes	Loam	>60	Well drained	Moderately high	C	Medium	Low	5	Moderate	Very limited
Sycamore silt loam	Silt loam	>60	Moderately well drained	Moderately high	D	Low	Low	4L	Slight	Somewhat limited
Vallecitos rocky loam, 30–45% slopes, eroded	Loam	12–36	Well drained	Very low	C	High	Low	7	Severe	Very limited
Vallecitos rocky loam, 45–75% slopes, eroded	Loam	12–36	Somewhat excessively drained	Very low	C	High	Low	7	Very 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
Soils Found Only in the Original Carnegie SVRA										
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 fine sandy loam, 0–2% slopes overwashed	Loam	>80	Well drained	High	B	Moderate	Low	3	Slight	Somewhat 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	NR	B	NR	NR	NR	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.

[5] Runoff rate classes are not available for Alameda County soils; K Factor is a measure of soil susceptibility to sheet and rill erosion.

Sources: State Parks 2007a, based on U.S. Natural Resources Conservation Service soil survey data; NRCS 2013–2014; data compiled by AECOM in 2014.

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. The expansion area also contained beds of clay, which reportedly consisted of 43 different grades ranging from low-grade material used to make sewer pipes to high-grade material used to make fine china. Clay mining began in 1901 and continued intermittently in the expansion area until 1952.

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.

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)

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 tailing piles located along Corral Hollow Creek, particularly in the expansion area. 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."

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.

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).

Mine tailings north of Corral Hollow Creek in the expansion area

Paleontological Resources

Professional Paleontological Standards

The Society of Vertebrate Paleontology (SVP) (1995), 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 (1995) established three categories of sensitivity for paleontological resources: high, low, 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 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 or low sensitivity. In keeping with the significance criteria of SVP (1995), 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 February 24, 2013 (UCMP 2013).

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 Paleontologic 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).

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 February 26, 2013. 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.	Low
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 2013.)	High
San Pablo Group (includes Neroly, Cierbo, and Briones)	Miocene marine sandstone, mudstone, siltstone, shale, tuff	Localities V-4902 and V-5017, near the expansion area 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 (2013).	High

Table 2-5. Paleontological Inventory and Assessment

Formation Name	Age/ Composition	Summary of Records Search Results	Paleontological Sensitivity
Tesla (includes Laguna Seca)	Paleocene-Eocene marine sandstone, siltstone, mudstone, shale	No vertebrate fossil localities have been reported to UCMP (2013). 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 (2013) 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 expansion area and along Tesla Road. Throckmorton also reported similar fossil remains in the expansion 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 (2013) from this formation, primarily in Fresno and Merced Counties, but stretching as far north as 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.	High
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 2013.)	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 2013.)	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 expansion 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. 1964:63, 116–117; Throckmorton 1988:46–70; Wagner et al. 1991; UCMP 2013; data compiled by AECOM in 2013

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 until large storm events occur. 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. (The roadway is called Tesla Road in Alameda County and Corral Hollow Road in San Joaquin County.)

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. The planning area's northwest corner (within the expansion area) falls within the Arroyo Seco watershed; this watershed is not discussed further because the watershed drains to the west of the planning area. (Please note that in the *Final Corral Hollow Watershed Assessment*, this area was mistakenly labeled as Arroyo Mocho.)

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.

UPPER WATERSHED DRAINAGE AREA

The Upper Watershed drainage area occupies 13,129 acres from the upper (southern) end of the Corral Hollow watershed boundary to approximately 6,000 feet upstream (south) of the Tesla Coal Mine Site. This drainage area consists of steep canyons composed of loams and gravelly loams with some rock outcroppings. The vegetation comprises primarily annual grasses, blue oak (*Quercus douglasii*), ghost pine (*Pinus sabiniana*), and sage. Streamflows in this drainage area usually continue into late spring and early summer. Small spring-fed pools occasionally persist in the channel throughout the year. Past and current land uses consist of sheep and cattle grazing, homesteading, and hunting.

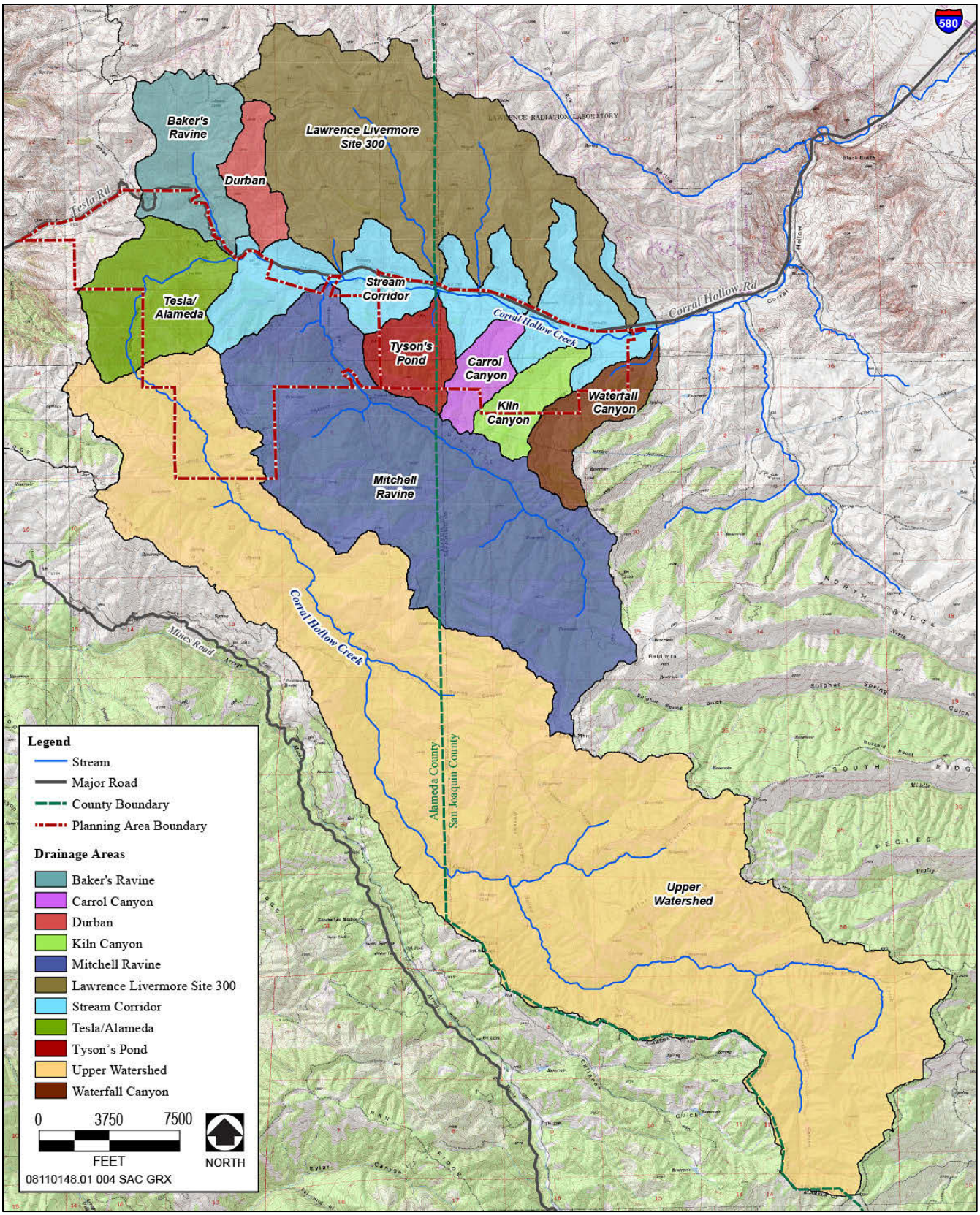
TESLA/ALAMEDA DRAINAGE AREA

The Tesla/Alameda drainage area occupies 1,086 acres from the discharge point of the Upper Watershed drainage area to the Tesla Road gate near the mouth of Baker's Ravine. The drainage area is composed of smooth, well-rounded hills with steep slopes; rock outcroppings are prevalent in some areas. The vegetation consists of annual grasses, scattered oaks, scattered perennial bunch grasses, California buckeye (*Aesculus californica*), and California sagebrush (*Artemisia californica*). Streamflows in this drainage area typically continue into late spring and early summer. Persistent seeps create pockets of wet

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

Drainage Area	Size (Acres)	Past and Current Land Uses
Upper Watershed	13,129	Sheep and cattle grazing, homesteading, hunting
Tesla/Alameda	1,086	Coal, clay, and sand mining; residential uses; concentrated ranching; grazing
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 *Sector 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

Figure 2-7. Location of the Corral Hollow Watershed's Drainage Areas

areas near the stream channel in the upper reaches of the Tesla/Alameda drainage area. Past mining activities resulted in considerable disturbance to the soils. Large tailing piles and gullies are present throughout the 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 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.

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 is transported downstream during large storm events. The blue sediment comes from erosion of the tailing piles left from the construction of the Hetch Hetchy tunnel.

Durban Drainage Area

The Durban drainage area totals 349 acres 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.

Stream Corridor Drainage Area

The Stream Corridor drainage area 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.

- 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.

- 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.

- 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

original 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.

- 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.

- 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 tailing 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.

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. SRI Road is located in the Kiln Canyon drainage area and is used by SRI personnel to access their experimental facilities in the Mitchell Ravine drainage area. 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.

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.

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:

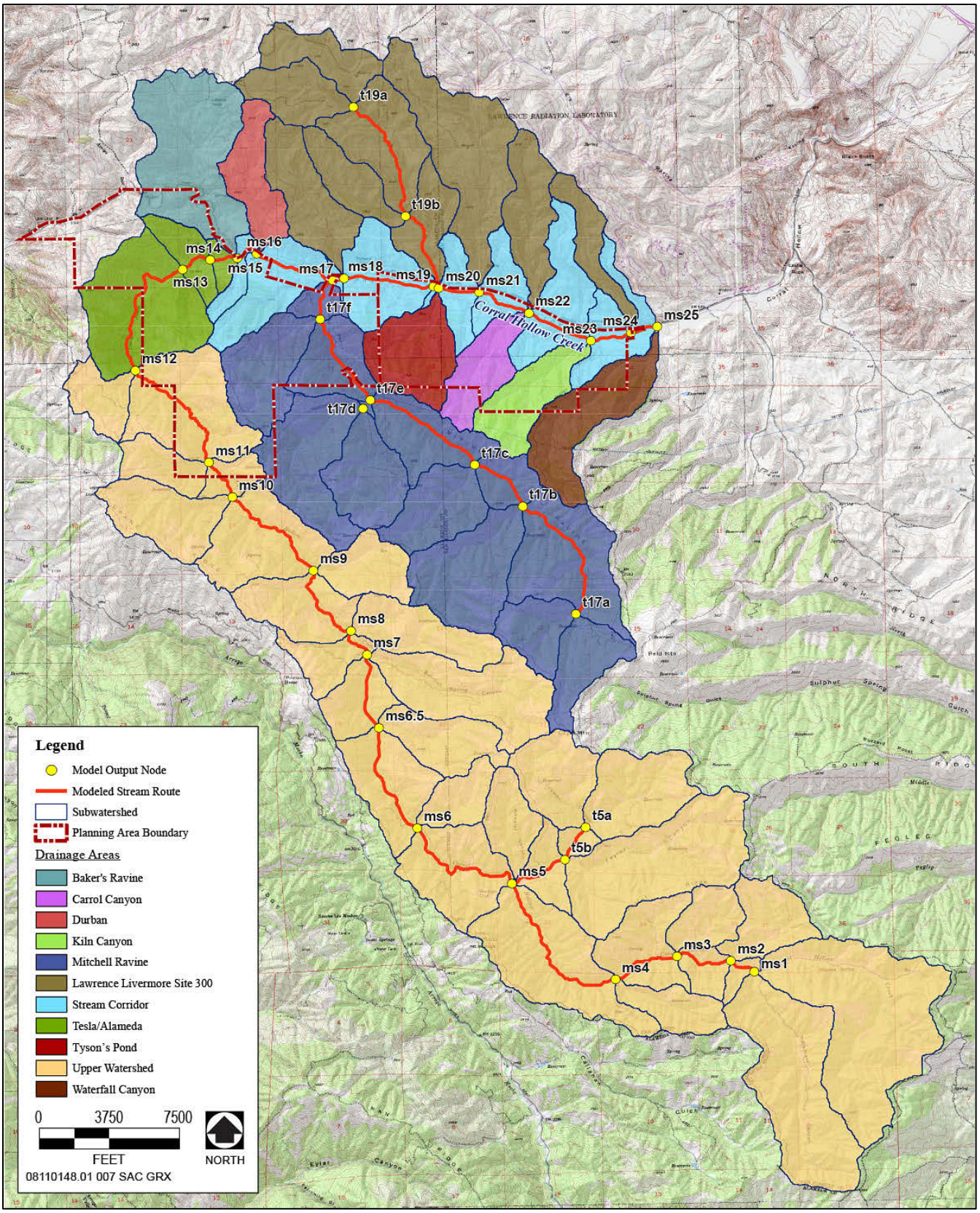
- *Continuous-rainfall modeling* simulates the continuous interactions between rainfall, runoff, infiltration, and evapotranspiration (ET). The model can be used for several purposes: to approximate the watershed's current water balance, to provide details about flow duration that are useful in assessing 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 2-8). 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 2-8) 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.



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

Figure 2-8. Subwatersheds and Model Output Nodes

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.

  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 (in the expansion 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.

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).

Table 2-7. Estimated Peak-Flow Rates for 24-Hour Storm Events

Recurrence Interval	Peak Flow (cubic feet per second) and Stream Channel Locations			
	Node ms13	Node ms14	Node ms23	Node ms24
2 years	8.9	13.7	257.9	257.9
10 years	136.2	136.0	635.0	635.1
100 years	735.8	739.4	1,444.1	1,444.8

Source: State Parks 2007a:110

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 original Carnegie SVRA on Flood Insurance Rate Maps. A small area along Corral Hollow Creek is located within the 100-year floodplain (Zone A). The remaining portion of the planning area is above the 500-year floodplain level (Zone X) (Figure 2-9).

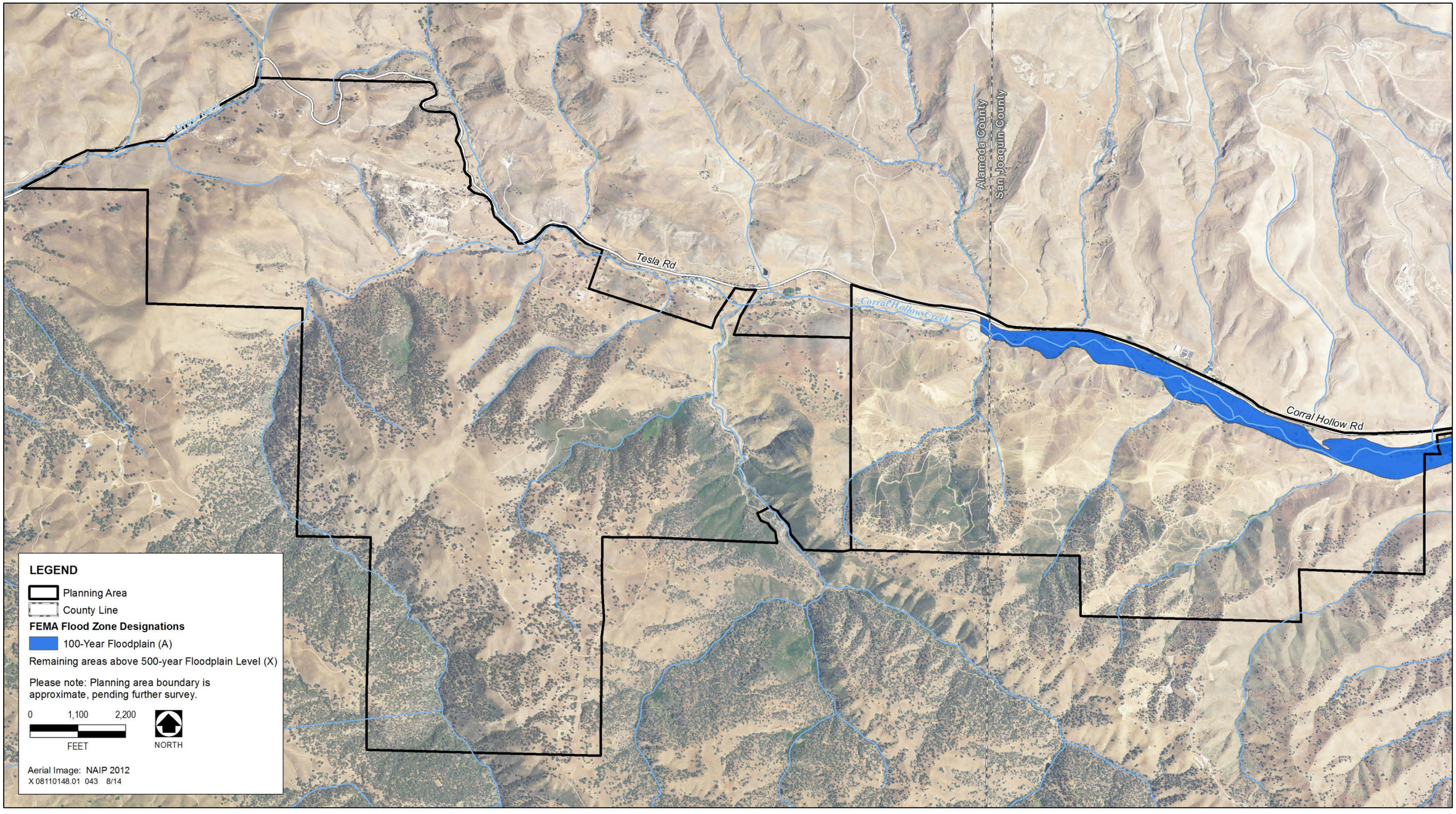
EROSION AND SEDIMENT TRANSPORT

The primary pollutant in the Corral Hollow watershed—sediment—is ultimately delivered to Corral Hollow Creek. Several sources in the planning area can generate erosion that causes sediment transport. These sources—sheet erosion, gullies, grazing, tailings 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.

Cows grazing along Corral Hollow Creek near the mine tailings in the expansion area



Source: FEMA 2009

Figure 2-9. Floodplain Map

- *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. Portions of the expansion area have been grazed in accordance with contracts between State Parks and private ranchers. The memorandum of understanding permitting grazing on the Tesla parcel expired in 2013. Grazing is still allowed on the Alameda County parcel. The grazing is "open," meaning that cattle are free to roam on large tracts of land for extended periods. Open grazing can promote loafing and repeated visits to areas that support high concentrations of desirable vegetation. Cattle tend to loaf mainly under the shade of oaks, and in the cool areas within the stream and tributaries. Thus, the repeated effects of hooves and clipping of vegetation tend to be concentrated in environmentally sensitive areas of the watershed. Stream banks can become denuded and large areas of land can be overgrazed, particularly on south-facing slopes and in poor soils. Cattle can be seen traversing the barren tailing piles and Corral Hollow Creek throughout the year. These activities can cause soil particles and mining waste to become detached and be transported.

- *Tailing Piles.* During the Tesla mining era, spoils from mining activities were deposited near the northern banks of Corral Hollow Creek. The tailing piles now parallel the creek for approximately 1,200 feet. The creek has slowly migrated toward these tailing piles over the years, and today it is actively eroding the toes. Over time, the tailing piles have been eroded by the tributary and transported to Corral Hollow Creek.

- *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 original 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 the original 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 tailings pile. 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.

- *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.

- *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.

- *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, 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. The historical thalweg in the Tesla mining district (i.e., the expansion area) was close to the 2004 location, although it appeared that the deposition of mine tailings on the north side of the riverbank may have shifted the modern thalweg slightly to the south in the eastern and western edges of the planning area. The water table was measured at 13 feet below the thalweg.

Within the original 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 tailing piles adjacent to Corral Hollow Creek, particularly in the expansion area. As mentioned in the tailing piles 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 the original Carnegie SVRA, increased sediment load and runoff from unstabilized 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 the original 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.

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 2011) 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 2011) 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 12 total locations sampled, 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 not located within the boundaries of the planning area, but it contributes flows to Corral Hollow Creek.

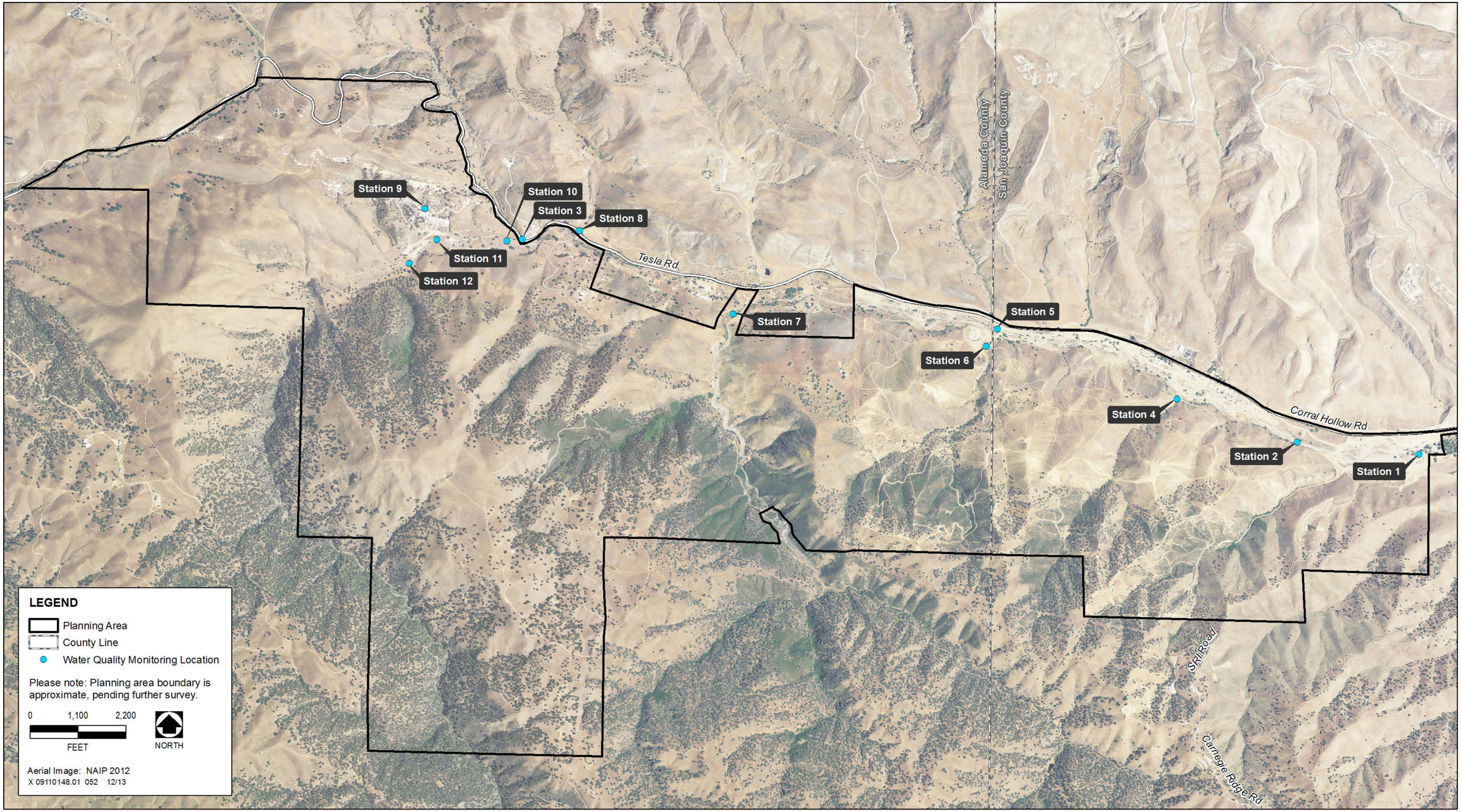
Carrol Pond receives flows from a relatively large portion of Carnegie SVRA. The pond drains through a perforated riser pipe and discharges to Station 4 on Corral Hollow Creek downstream of the original Carnegie SVRA ranger station. Flows from Carrol Pond deposited substantial amounts of sediment and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

Figure 2-10. Water Quality Sampling Locations

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 planning area (Station 12) to the downstream end of the planning area (Station 1).

- 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.

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 2012a). 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 2012a). Livermore (which is located near the planning area) receives approximately 14 inches of annual precipitation, with most occurring in the winter months (WRCC 2012b).

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 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 $PM_{2.5}$, 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 the original 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.

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. The absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but as lower frequency infrared radiation.

The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency (longer wavelength) radiation. Most solar radiation passes through GHGs; however, infrared radiation is selectively absorbed by GHGs. 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. Without the greenhouse effect, the earth would not be able to support life as we know it.

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 2007).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants (TACs), 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). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe.

The exact lifetime of any particular GHG molecule depends on multiple variables and cannot be pinpointed. However, more CO_2 is currently emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54 percent is sequestered through ocean uptake, uptake by Northern Hemisphere forest regrowth, and other terrestrial sinks; the remaining 46 percent of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998). At 78 percent of GHG emissions, fossil fuel combustion is the biggest source of GHG emissions in the U.S. since 1990 (EPA 2013a).

Natural resource management is changing as warming trends take place or scientists predict future warming. As a result of these trends, resource management focuses on reducing key environmental stressors on biological resources, providing hedges against resource losses caused by climate change, and determining possible evolutionary responses. The precise quantity of GHGs that it takes to ultimately result in climate change is not known, although the quantity is enormous. No single project would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climates.

The use of OHVs at Carnegie SVRA creates exhaust emissions from fuel combustion to operate the OHVs and from vehicles driven various distances to reach Carnegie SVRA. These emissions include GHGs. Typically, few OHVs have devices to control emissions; as a result, all gases generated from the combustion of fuel, including GHGs, are emitted to the atmosphere. Adding these GHGs will add to the cumulative impacts on the earth's changing climate.

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 rarest plant and animal taxa and vegetation types (CNDDB 2011)

- USFWS database of endangered and threatened species (USFWS 2012a)
- California Native Plant Society (CNPS) online inventory of rare and endangered plants (CNPS 2012a)
- *Listed Observed Plant and Animal Species, Alameda-Tesla, Carnegie SVRA and LLNL Site 300 Properties* (CNPS 2012b)
- 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 2011b)
- Wetland delineation of the planning area (TRA 2010a) and subsequent verification by the U.S. Army Corps of Engineers (USACE) (2010)
- *Biological Assessment for Carnegie SVRA and Mitchell Ravine Projects* (TRA 2010b)
- 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) (EACCSSC 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. The expansion area is located within Zones 9 and 10 of the EACCS. Although State Parks is not subject to the EACCS, the planning documents were reviewed for applicable conservation strategies for the expansion area.
- *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. Most 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.[f], 2005b) and unpublished HMS data from surveys conducted during 2011 through 2014. 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).

  A major component of the updated HMS is the development of a custom data management system (DMS) to accumulate, standardize, and analyze records of plants and animals in the SVRAs. The DMS, which is being developed by UCD staff members, is a web-based application that enables State Parks environmental scientists to enter data, such as species observations and monitoring results, from the field or office. The DMS incorporates standards for data elements, such as species

names and vegetation classifications, to ensure data integrity and facilitate analyses and comparisons among sites. The DMS contains a comprehensive set of tables comprising standardized data entry fields for all the variables being measured by State Parks environmental scientists during monitoring; these are linked to web forms for data entry. Individualized forms are available for each type of monitoring being conducted as part of the HMS (e.g., bird point counts and amphibian dip net surveys).

The first trial of the DMS was released in July 2013 and revisions were incorporated based on this trial. Field testing of the revised DMS is ongoing and improvements are being incorporated based on user suggestions (Meese 2013). The DMS will include data analysis tools, including statistical tests and graphical capabilities (Meese 2013). Once complete, the DMS will contain all existing HMS data provided to UCD staff members or entered directly into the DMS by State Parks staff members. DMS users will then be able to analyze and provide graphical representations of their monitoring data and species observations records using online tools, and then save their results so that existing monitoring data can be accumulated and standardized for more effective and efficient evaluation of OHV effects on plant and animal resources at California's SVRAs (Meese 2013).

VEGETATION

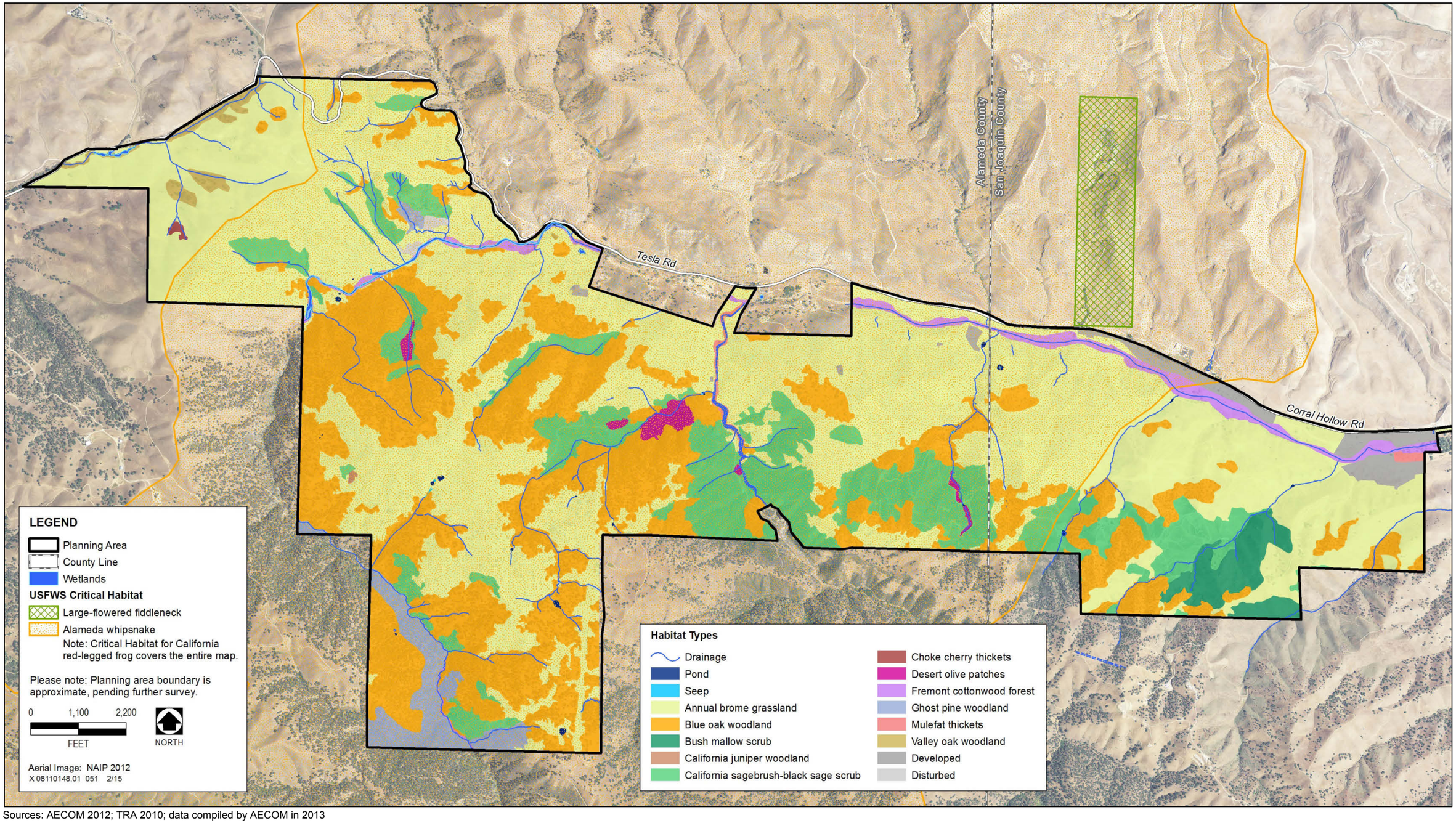
Vegetation in the planning area was mapped by AECOM in 2012 specifically in support of the planning process. Multiple sources were used: previous vegetation mapping efforts in the planning area (State Parks 1980, 2000) and the *Existing Vegetation* (i.e., Eveg) maps; aerial imagery interpretation; and field verification and refinement (AECOM 2012).

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 the expansion area were conducted April 20–24, June 30, and October 13, 1998 (State Parks 2000), and floristic surveys of select locations were conducted by AECOM and TRA Environmental Sciences during March, April, and May 2014.

A delineation of wetlands and other waters of the United States has been conducted for the entire planning area (TRA 2010a) and verified by USACE (2010). Geographic information system (i.e., GIS) shape files from both the USACE-verified wetland delineation and ground-verified and refined vegetation layers were used to compile the vegetation map (Figure 2-11).

VEGETATION CLASSIFICATION

Vegetation nomenclature generally follows *A Manual of California Vegetation* (MCV) (Sawyer et al. 2009) 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.



Sources: AECOM 2012; TRA 2010; data compiled by AECOM in 2013

Figure 2-11. Habitat Types Found at Carnegie SVRA

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 accordance with the *Memorandum of Understanding for Cooperative Vegetation and Habitat Mapping and Classification* (California Biodiversity Council 2000). 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).

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, 16 vegetation types are present in the planning area (Table 2-8). As described below, these vegetation types include Fremont cottonwood forest, blue oak woodland, valley oak woodland, California juniper woodland, ghost pine woodland, California sagebrush/black sage scrub, bush mallow scrub, mule fat thickets, patches of desert olive, choke cherry thickets, and annual brome grassland. Disturbed and developed areas are also present. The planning area also contains water bodies consisting of ponds, seeps, and linear drainages (Figure 2-11).

Fremont Cottonwood Forest

Fremont cottonwood forest grows along Corral Hollow Creek and covers approximately 91 acres of the planning area. This vegetation type has an open tree canopy dominated by Fremont cottonwood (*Populus fremontii*). California sycamore (*Platanus racemosa*) is a common codominant and black willow (*Salix gooddingii*) is an occasional associate. For an area to qualify as Fremont

Fremont cottonwood forest, March 2011

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

Type	Acres
Fremont cottonwood forest	91
Blue oak woodland	1,291
Valley oak woodland	33
California juniper woodland	1
Ghost pine woodland	100
California sagebrush/black sage scrub	588
Bush mallow scrub	128
Mule fat thickets	4
Desert olive patches	24
Choke cherry thickets	2
Annual brome grassland	2,341
Seep	0.29
Pond	4
Drainage	74
Disturbed	5
Developed	87

Sources: State Parks 2000, Ecosystems West 2004; AECOM 2012; TRA 2010b; data compiled by AECOM in 2013

cottonwood forest, the relative cover of Fremont cottonwood in the tree canopy must be at least 30 percent (absolute cover at least 5 percent). Thickets of mule fat (*Baccharis salicifolia*) are scattered throughout the understory of this vegetation type. Other shrub associates include arroyo willow (*Salix lasiolepis*) and coyote brush. Fremont cottonwood forest occurs on floodplains along perennial and intermittent streams.

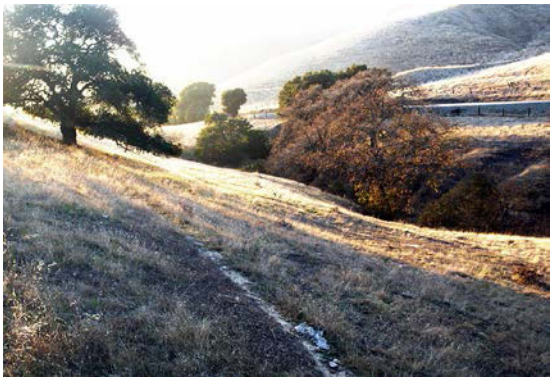
Blue Oak Woodland

Blue oak woodland is found extensively throughout the planning area, covering approximately 1,291 acres. This vegetation type is dominated by blue oak intermingled with occasional stands of foothill pine (*Pinus sabiniana*), California juniper (*Juniperus californica*), and California buckeye. Blue oak makes up greater than 50 percent relative cover in the tree canopy and associated tree species make up less than 30 percent relative tree canopy cover. The shrub layer is either lacking or consists of scattered California sagebrush (*Artemisia californica*). Herbaceous species are the same as those in the annual

Blue oak woodland in the expansion area

brome grassland described below. The tree canopy is intermittent to continuous or savanna-like, with trees spaced one to two typical canopy widths (approximately 30 meters) apart. Blue oak woodland occurs on shallow, rocky, low-fertility soils in valley bottoms, foothills, ridges, and rock outcrops.

Valley Oak Woodland


Valley oak woodland along Arroyo Seco Creek, December 2011

Valley oak woodland is found along Arroyo Seco Creek and two tributaries and covers approximately 33 acres of the planning area. This vegetation type is dominated by a mix of valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), California sycamore, red willow (*Salix laevigata*), and arroyo willow. Relative cover of valley oak in the tree canopy is at least 30 percent in this alliance. Scattered poison oak (*Toxicodendron diversilobum*) and California sagebrush can be found in the shrub layer. The herbaceous layer consists of the same species found in annual brome grassland. Creeping wildrye (*Elymus triticoides*) and Douglas' mugwort (*Artemisia douglasiana*) are also present on the upper slopes and saltgrass (*Distichlis spicata*) and swamp pricklegrass (*Crypsis schoenoides*) are also present in the Arroyo Seco Creek channel. Valley oak woodland occurs on seasonally saturated alluvial or residual soils of valley bottoms.

California Juniper Woodland


California juniper woodland, December 2011

In the planning area, California juniper woodland consists of one small stand covering approximately 1 acre of the expansion area. This vegetation type is dominated by California juniper, and the canopy of this stand is dense. No understory exists in the planning area, although California juniper woodland typically has an open to intermittent tree canopy with a shrub layer and a sparse herbaceous layer. For an area to qualify as part of the California juniper alliance, absolute cover of California juniper must be at least 1 percent and no other tree species with greater cover can be present.

Ghost Pine Woodland


Ghost pine woodland, December 2011

Approximately 100 acres of ghost pine woodland are present in the expansion area along the lower slopes of Corral Hollow Creek in the southern part of the planning area, and around the old mining area. This vegetation type

is dominated by ghost pine (*Pinus sabiniana*), with blue oak, coast live oak, and California buckeye as codominants. The shrub and herbaceous layers are similar to those found in blue oak woodland. This vegetation type is found on streamside terraces, valleys, slopes, and ridges with shallow, infertile soils. Ghost pine woodland was mapped in areas where absolute cover of ghost pine is greater than 10 percent.

California Sagebrush/Black Sage Scrub

California sagebrush/black sage scrub is found extensively on moderate to steep slopes throughout the planning area, covering approximately 588 acres. In this vegetation type, 30–60 percent relative cover of both California sagebrush and black sage (*Salvia mellifera*) is present in the shrub canopy. California yerba santa (*Eriodictyon californicum*) and coyotebrush are occasional associates, and the herbaceous layer is very sparse.

California sagebrush/black sage scrub, December 2011

Bush Mallow Scrub

Bush mallow scrub is present in the southeastern portion of Carnegie SVRA in areas that burned in 2009, and covers approximately 128 acres. Bush mallow scrub is dominated by bush mallow (*Malacothamnus fasciculatus*), with occasional California yerba santa resprouting from burned stumps. Areas mapped as bush mallow scrub contain at least 50 percent relative cover of bush mallow in the shrub layer. The herbaceous layer is similar to that of annual brome grassland. This vegetation type is generally found in loam or clay soils on slopes that have experienced a fire event recently (within the last 10 years).

Bush mallow scrub, March 2011

Mule Fat Thickets

Mule fat thickets are present in small patches along Corral Hollow Creek and cover approximately 4 acres of the planning area. This vegetation type is dominated by mule fat, with scattered Fremont cottonwood and California sycamore occasionally present at low cover. Relative cover of mule fat in the shrub canopy is greater than 50 percent and the herbaceous layer is

Mule fat thickets, March 2011

sparse or absent. Where Fremont cottonwood trees are greater than 5 percent absolute cover, these areas are classified as Fremont cottonwood forest. Mule fat thickets occur in mixed alluvial soils in canyon bottoms, irrigation ditches, floodplains, lake margins, and stream channels.

Desert Olive Patches

Patches of desert olive (*Forestiera pubescens*) are present in the planning area in ravines along creeks and extending upslope. They cover approximately 24 acres of the planning area. Desert olive makes up greater than 50 percent of the relative shrub canopy cover of this vegetation type, with occasional coyotebrush, toyon (*Heteromeles arbutifolia*), and poison oak also present. The shrub layer is dense and very little herbaceous understory is present. Desert olive patches are found on floodplains, stream banks, springs, river terraces, and washes.

Desert olive patches. December 2011

Choke Cherry Thickets

Choke cherry (*Prunus virginiana*) thickets are present in only one location in the planning area, covering approximately 2 acres on a north-facing slope at the west end of the expansion area. In this vegetation type, choke cherry may be dominant or codominant with other shrubs. In the planning area, choke cherry is dominant, with a few shrubs of poison oak and blue elderberry (*Sambucus nigra* ssp. *caerulea*) also present. The shrub layer is very dense, with very little herbaceous understory. This vegetation type occurs in rock outcrops, draws, and stream terraces.

Annual brome grassland and off-road vehicle trails in Carnegie SVRA. March 2011

Annual Brome Grassland

Annual brome grassland is present extensively across the planning area, covering approximately 2,341 acres. As in all of California's annual grasslands, species composition and abundance vary considerably in annual grasslands in the planning area, depending on site factors such as soil chemistry and texture, topography, and disturbance regime. Species composition and abundance also vary temporally from season to season and year to year (Sawyer et al. 2009:30). Based on the dominant species identified in this vegetation type during the 2012 survey and several previous vegetation mapping efforts and floristic surveys in the planning area (State Parks 1980, 2000; Ecosystems West 2004), the grassland was classified as brome dominated.

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*).

In the original Carnegie SVRA, the soil is highly disturbed by OHV traffic and the annual brome grassland is dominated mainly by these nonnative annual grasses and forbs. The expansion area's soil is much less disturbed and substantial numbers of native forbs are also present, especially in the spring. 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 (*Stipa pulchra*), nodding needle grass (*S. 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.

Seep

Three seeps, covering approximately 0.29 acre, are present in the planning area (Figure 2-11).

Seep between two ponds in the expansion area. December 2011

One seep is located between two ponds in the expansion area where seepage from the ponds supports wetland plant species. Dominant species include annual rabbitsfoot grass (*Polypogon monspeliensis*), western marsh cudweed (*Gnaphalium palustre*), spiny cocklebur (*Xanthium spinosum*), turkey mullein (*Eremocarpus setigerus*), gumweed (*Grindelia* sp.), and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*).

Another seep dominated by similar species is located downslope of those same ponds at the top of an ephemeral drainage. The third seep, characterized by saltgrass and swamp pricklegrass, is located in the expansion area below a cattle water trough on the bank of Corral Hollow Creek.

Based on the dominant species observed, these areas cannot be clearly categorized using the MCV classification system because the MCV does not include any vegetation types that are dominated by the same suite of species observed in the seeps.

Pond

Twenty-four ponds cover approximately 4 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.

One of many ponds scattered throughout the planning area

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.
- *Arroyo Seco Creek* is a deeply downcut narrow channel covered by valley oak woodland.
- *Corral Hollow Creek* is a wide and braided channel dominated by Fremont cottonwood forest and mule fat thickets.
- *Mitchell Ravine Creek* is a deep single channel that is mostly nonvegetated except for a few California sycamores and some mule fat, coyotebrush, and California sagebrush scattered sparsely throughout the channel. The nonvegetated portion of Mitchell Ravine Creek covers approximately 6 acres.

Total acreage of the drainages in the planning area is approximately 74 acres.

Corral Hollow Creek, March 2011

Disturbed area above California sagebrush/black sage scrub, March 2011

DISTURBED

Disturbed portions of the planning area include approximately 5 acres of bare land at the Tesla Coal Mine Site in the expansion area.

DEVELOPED

Developed areas in the planning area—roads, buildings, parking and staging areas, picnic areas, and practice tracks—cover approximately 87 acres.

Developed area in Carnegie SVRA, March 2011

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 the original Carnegie SVRA, habitat assessments and vegetation mapping performed by AECOM in 2012, 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:

- 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*)
- Western 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*)

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
- 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 2011). The CNPS inventory of rare and endangered plants of California (CNPS 2012a) was also reviewed for the same 12-quadrangle search area in support of the planning process and the Consortium of California Herbaria (2012) was also reviewed for special-status plant records in the planning area and vicinity.

The USFWS species list generator, used for a 12-quadrangle search centered on the Midway and Cedar Mountain quadrangles, and the USFWS critical-habitat mapper were used as secondary resources. This search yielded nine additional special-status wildlife species (not included in the CNDDB search) and two additional special-status plant species. The two additional plant species, palmate-bracted bird's beak (*Chloropyron palmatum*) and Contra Costa goldfields (*Lasthenia conjugens*), have no potential to occur in the planning area because there is no suitable habitat for them.

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). 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. Jones and Stokes conducted floristic surveys of the expansion area April 20–24, June 30, and October 13, 1998. AECOM and TRA Environmental Sciences revisited the locations of previously recorded special-status plant occurrences during March, April, and May 2014.

These survey results and CNDDB records have documented 12 species in the planning area and an additional 17 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 2-12. Special-status plant occurrences located during Jones and Stokes 1998 surveys were reported to the CNDDB and are included in Figure 2-12. Special-status plant occurrences documented by Ecosystems West in 2003 and by AECOM/TRA Environmental Sciences in 2014 are depicted in Figure 2-13. 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. 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 10 records of green fiddleneck from Alameda County and seven records from San Joaquin County, including a 1989 record from LLNL (Consortium of California Herbaria 2012). Green fiddleneck was found in the expansion area during surveys conducted in 2003 (Ecosystems West 2004). 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.

Additional CRPR 1B 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:

- Bent-flowered fiddleneck (*Amsinckia lunaris*)
- Recurved larkspur (*Delphinium recurvatum*)
- Tracy's eriastrum (*Eriastrum tracyi*)
- Mt. Hamilton coreopsis (*Leptosyne hamiltonii*)
- Mt. Diablo phacelia (*Phacelia phacelioides*)
- Hooked popcorn-flower (*Plagiobothrys uncinatus*)

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-two 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 2-10). Figure 2-14 shows the distribution of CNDDB records of special-status wildlife occurrences documented within 5 miles of the planning area. Figure 2-15 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.)

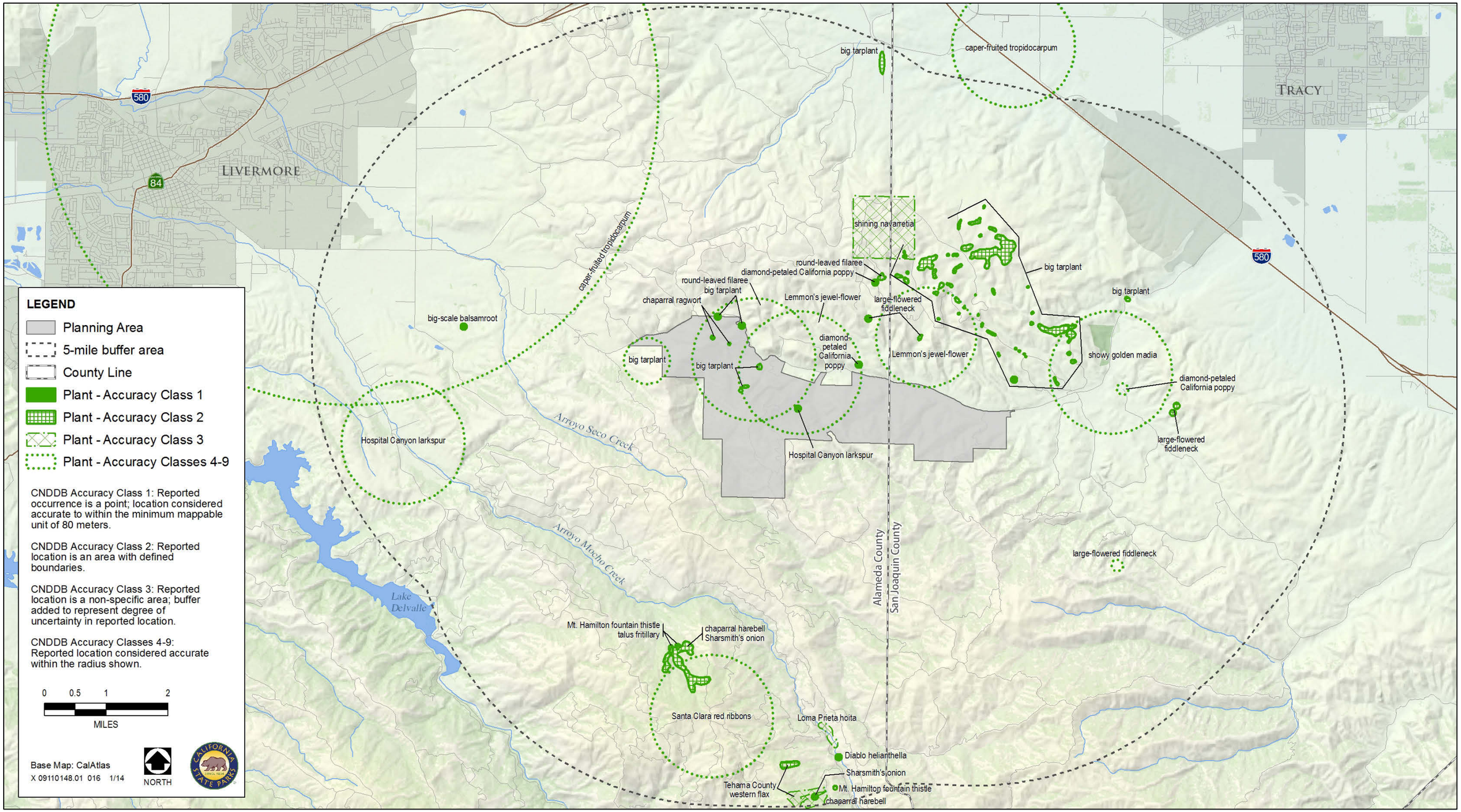
Some of the stock ponds in the planning area support special-status species, namely western pond turtle, western spadefoot, California red-legged frog, and California tiger salamander. These species have persisted and thrived at Carnegie SVRA despite ongoing OHV activity. However, because of their status, 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.

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

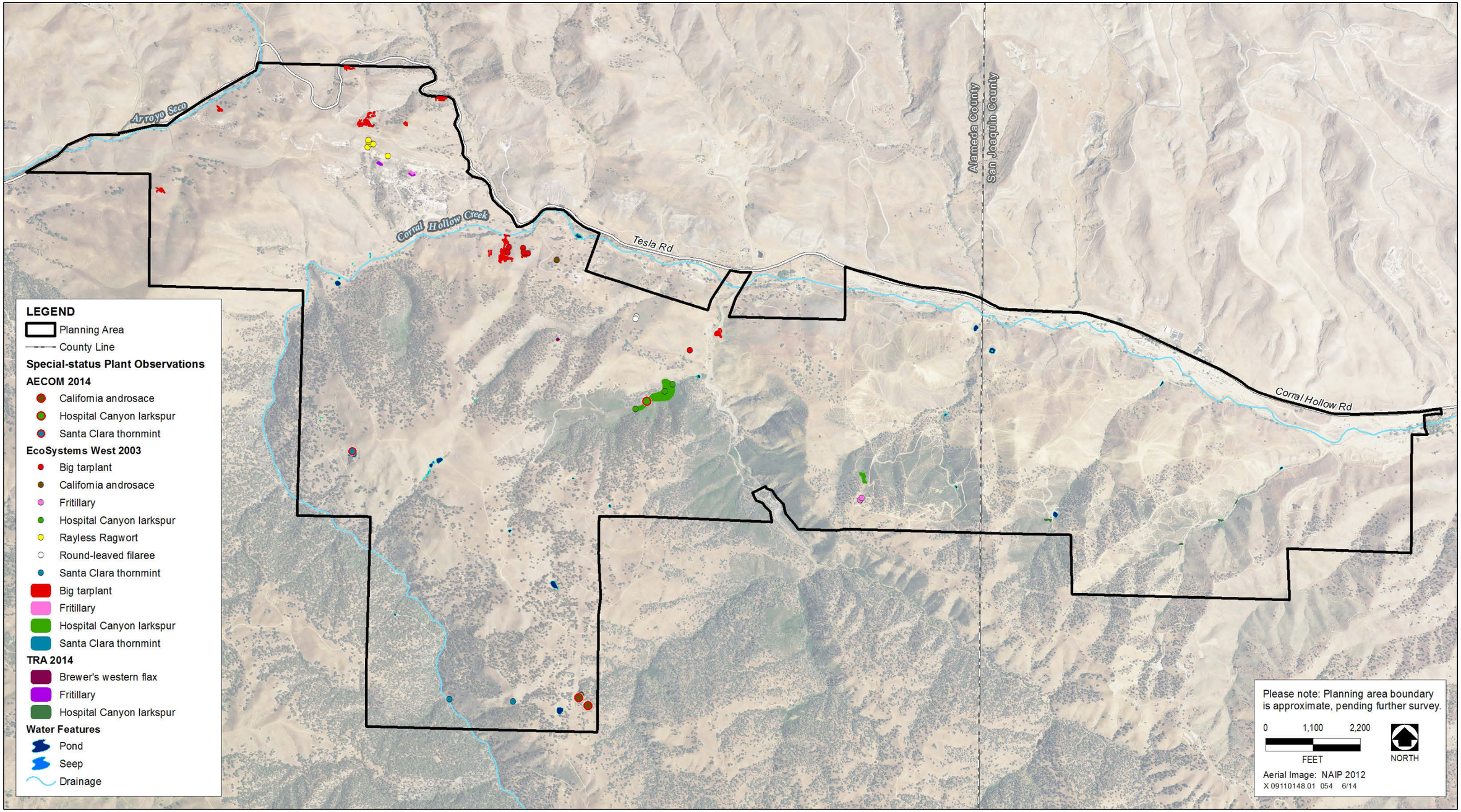
CALIFORNIA TIGER SALAMANDER

California tiger salamanders are known to breed in ponds in the expansion area. This species has been detected at all ponds in the expansion area except North Parcel, Mitchell Ravine, and Mobile Home Ponds (State Parks n.d.[f]). Several California tiger salamander larvae were



Source: CNDDB 2013

Figure 2-12. Special-Status Plant Species Occurrences within a 5-Mile Search Radius



Sources: Data provided by State Parks in 2014, adapted by AECOM; TRA 2014; Ecosystems West 2004, adapted by AECOM in 2014

Figure 2-13. Special-Status Plant Species Occurrences within the Planning Area

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

Species	California Rare Plant Rank*	Comments
SPECIES WITHIN THE PLANNING AREA		
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, all in the expansion area, during surveys conducted in 2003 (Ecosystems West 2004).
Round-leaved filaree *California macrophyllum*		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.
Forked hareleaf *Lagophylla dichotoma*		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.
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.
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 expansion 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 discovery in the expansion area 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 expansion area.
California androsace *Androsace elongata* ssp. *acuta*		The scrub and woodland communities and the grasslands provide potentially suitable habitat for this species, which has been documented in four locations in the expansion area.
Stinkbells *Fritillaria agrestis*		The scrub and woodland communities and the grasslands provide potentially suitable habitat for this species. It has been observed in the expansion area (State Parks 2000), although specific locations are not known. 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.
Sylvan microseris *Microseris sylvatica*		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), although specific locations are not known. This species was not found during plant surveys conducted in 2003 (Ecosystems West 2004).
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.

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

Species	California Rare Plant Rank*	Comments
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.
SPECIES DOCUMENTED WITHIN 5 MILES OF THE PLANNING AREA		
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.
Diamond-petaled California poppy *Eschscholzia rhombipetala*		Alkaline clay soils in the grasslands provide potentially suitable habitat for this species.
Loma Prieta hoita *Hoita strobilina*		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.
Showy golden madia *Madia radiata*		The woodland communities and grasslands provide potentially suitable habitat for this species.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*		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*		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*		The scrub and woodland communities and grassland provide potentially suitable habitat for this species.
Chaparral harebell *Campanula exigua*		This species grows in rocky places in chaparral, usually in serpentinite soils. Suitable habitat may be present in rocky outcrops within the planning area.
Lemmon's jewelflower *Caulanthus lemmonii*		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*		This species is found in serpentine seeps in chaparral, cismontane woodland, and annual grasslands. No serpentine seeps are present in the planning area.
Talus fritillary *Fritillaria falcata*		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*		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 dwarf flax *Hesperolinon breweri*		This species is found in chaparral, cismontane woodland, and annual grasslands, usually on serpentine soils. This species was found 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*		The woodland communities and grasslands provide potentially suitable habitat for this species.

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

Species	California Rare Plant Rank*	Comments
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*		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.
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.
Santa Clara red ribbons *Clarkia concinna* ssp. *automixa*	4.3	The scrub and woodland communities provide potentially suitable habitat for this species.

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

Sources: CNDDB 2011; Consortium of California Herbaria 2012; CNPS 2012a, 2012b; State Parks 2000; Ecosystems West 2004; data compiled by AECOM and TRA in 2014

also found in California Tiger Salamander Pond and Tony's Pond during HMS surveys conducted by State Parks in 2005 (State Parks 2005b).

California Red-legged Frog

California red-legged frogs are known to occur in ponds in the expansion area. Surveys conducted at the original 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 and all of the ponds in the expansion area except North Parcel and Ravine Ponds (State Parks n.d.[f]). This species has been detected at Lower Juniper and Lime Kiln Ponds in Carnegie SVRA (State Parks n.d.[f]).

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 original Carnegie SVRA. The expansion area also provides suitable habitat for the species (State Parks n.d.[f]). The planning area also is within designated critical habitat for the species. Therefore, Alameda whipsnake could potentially inhabit the planning area.

Table 2-10. Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area

Species	Status*	Comments
INVERTEBRATES		
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 Creek (State Parks 2005b). Additional elderberry shrubs that would provide potentially suitable habitat for this species may occur in suitable riparian and upland habitats within the planning area.
REPTILES AND AMPHIBIANS		
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 for California red-legged frog in the planning area have documented frogs in several ponds dating back to 1998 (State Parks 2000). State Park staff members continue to find California red-legged frog in several ponds during annual monitoring as part of the HMS.
Foothill yellow-legged frog *Rana boylii*	CSC	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 expansion area in 2000 (State Parks 2000, n.d.[f]).
Western spadefoot *Spea hammondii*	CSC	Ponds in the planning area provide potential breeding habitat for this species and annual grassland habitats provide potential upland refugia in the planning area. During HMS surveys, this species has been documented to occur in California Tiger Salamander Pond, Corral Hollow Creek backwaters, and Tesla Stock Pond.
Western pond turtle *Emys marmorata*	CSC petitioned for listing under ESA	Perennial ponds in the planning area provide potential habitat for this species. Western pond turtles have been documented to occur in Kiln Canyon Basin, Tesla Stock Pond, Sector Office Pond, Old Pipe Pond, and the Tesla West portion of Corral Hollow Creek.
San Joaquin whipsnake *Masticophis 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.
California 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.
California tiger salamander *Ambystoma californiense*	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 several ponds in the planning area: California Tiger Salamander Pond, Tony's Pond, Tesla Stock Pond, Ravine Corral Pond, Sector Office Pond, and Lone Oak Pond.
Alameda whipsnake *Masticophis 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.
Silvery legless lizard *Anniella pulchra 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.
BIRDS		
Burrowing owl *Athene cunicularia*	CSC (breeding sites and some wintering sites)	Annual grassland habitats in the planning area could potentially support burrowing owls. Suitable habitat exists for burrowing owls and is maintained by grazing activities that occur in the expansion area. A burrowing owl was observed in the expansion area during reconnaissance surveys. Burrowing owls have also been observed on the adjacent LLNL Site 300.

Table 2-10. Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area

Species	Status*	Comments
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.
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; CNPS 2012b).
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 expansion 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 (Hunt 2002; Hunt and Hunt 2006, 2013).
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.
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.
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 (State Parks n.d.[b]).
Yellow warbler *Dendroica 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, and 2013, and it could nest in riparian habitat in the planning area.
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 2011, and it could nest in the planning area.
Tricolored blackbird *Agelaius tricolor*	CSC (nesting)	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.
MAMMALS		
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]).
San Joaquin pocket mouse *Perognathus inornatus 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 (State Parks n.d.[c]).
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 2011) and USFWS expects that this species is present at least periodically (USFWS 2012a).
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 expansion 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 (de Silva, pers. comm., 2014).

Table 2-10. Special-Status Wildlife Species Observed or Assumed to Be Present in the Planning Area

Species	Status*	Comments
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. No focused surveys for western mastiff bat have occurred in the planning area. However, it is assumed that the species can forage in the planning area at least periodically, given its distribution in California. Rock outcroppings may provide suitable roost habitat.
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. No focused surveys for Townsend's big-eared bat have occurred within the planning area. However, 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 and Lime Kiln Cave in the expansion area and possibly in rock outcroppings in the planning area. The 2008 HMS report mentions the species as occurring in the planning area (State Parks n.d.[d]). This species was identified in the Tesla Coal Mine by State Parks staff members in September 2014 (de Silva, pers. comm., 2014).

Notes: HMS = Habitat Monitoring System; LLNL = Lawrence Livermore National Laboratory; SVRA = State Vehicular Recreation Area; USFWS = U.S. Fish and Wildlife Service

* Statuses:

BE = protected by Bald Eagle and Golden Eagle Protection Act
BLM = U.S. Bureau of Land Management sensitive species
CFT = California fully protected species
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
W = CDFW watch list

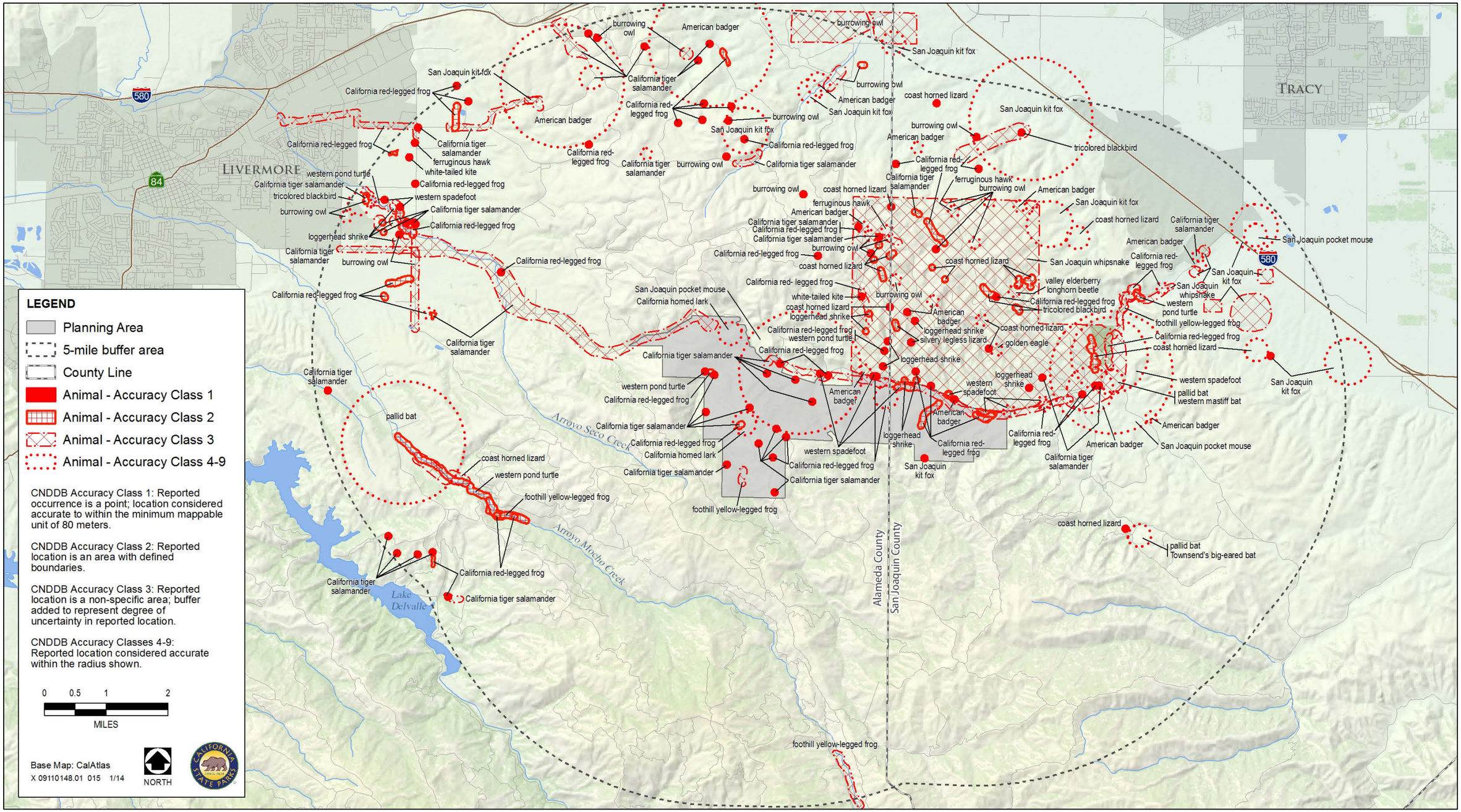
Sources: CNDDB 2011; State Parks 2000, 2005b, n.d.[c], n.d.[d], n.d.[f], 2014 (raw data); USFWS 2012a; CNPS 2012b; Shuford and Gardali 2008

San Joaquin Kit Fox

San Joaquin kit fox has not been observed in the expansion area (State Parks n.d.[f]). 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 original SVRA in 2002 (CNDDB 2011, see Figure 2-14). USFWS also noted that it considers San Joaquin kit fox to potentially occur within the original Carnegie SVRA and the expansion area (USFWS 2012b).

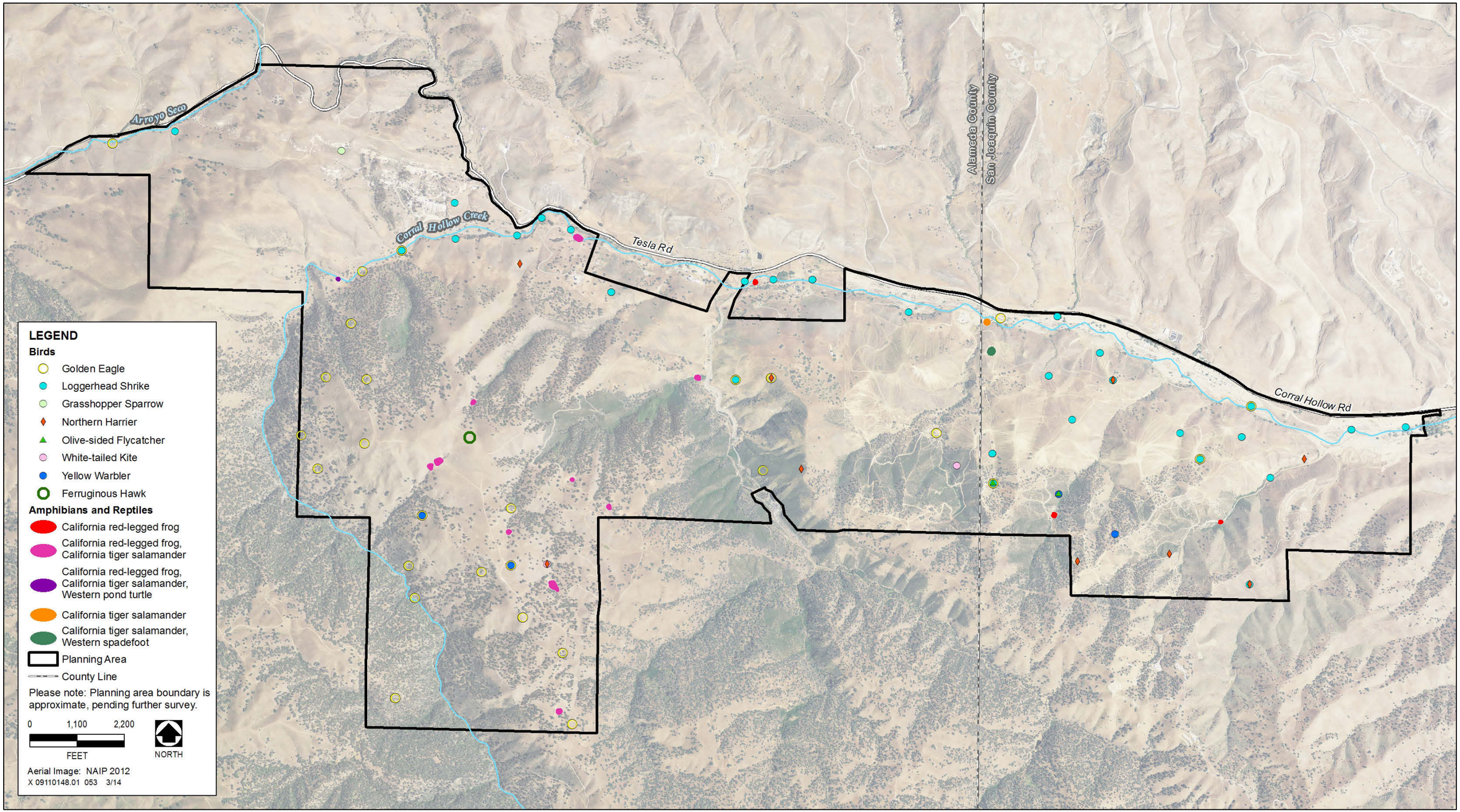
Valley Elderberry Longhorn Beetle

Elderberry shrubs have been documented in Corral Hollow Creek (State Parks 2005b). Additional elderberry shrubs that would provide potentially suitable habitat for this species may occur in suitable riparian and upland habitats in the planning area. Elderberry shrubs with branches greater than 1 inch in diameter are considered potential habitat for the valley elderberry longhorn beetle.



Source: CNDDB 2013

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



Source: State Parks 2012, adapted by AECOM

Figure 2-15. Special-Status Bird, Amphibian, and Reptile Occurrences Recorded during HMS Surveys

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 at the original Carnegie SVRA 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.

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 (2011), wetland delineation for the planning area (TRA 2010a), and State Parks staff members are the primary sources of information about the location and extent of sensitive habitats in the planning area.

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, choke cherry thickets, Fremont cottonwood forest, and valley oak woodland.

WATERS OF THE UNITED STATES

The 2010 wetland delineation verified by USACE identified a total of 78.39 acres of waters of the United States in the planning area consisting of Corral Hollow Creek, Mitchell Ravine Creek, stock ponds, and other seasonal riverine features. The majority of this acreage (approximately 63 acres) is contained within

the channels of Corral Hollow Creek and Mitchell Ravine Creek. There are 24 ponds/basins in the planning area comprising approximately 4 acres. The only wetlands in the planning area not contained within the ordinary high-water mark of a pond or creek are the seeps (0.29 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, valley oak woodland, 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 and Mitchell Ravine 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 valley oak woodland and 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

Carnegie SVRA was subjected to a complete cultural resources inventory and evaluation from 2008 through 2010 (ASC 2010). This investigation resulted in the identification and recordation of 70 cultural sites. Of these sites, six reflect prehistoric land use, 62 are the result of various historic-era themes, and two contain the remains of both prehistoric and historic-era occupation. State Parks determined that 18 of the historic-era resources are contributing elements of the Tesla Mining and Industry Historic District and that the 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. Each of the contributing resources is associated with one of the following periods:

- Early Coal Exploration and Mining, 1855–1866
- The San Francisco and San Joaquin Coal Mining Company, 1890–1905
- Sand Mining for the Pacific Window Glass Company, 1890–1908
- Clay Mining for Carnegie Brick and Pottery Works, 1901–1911

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 district.

PREHISTORIC 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.

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.

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.

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.

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

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). Two miles west of these facilities, the Pottery Works manufactured sewer pipe and the 45–60 workers resided in a small town named Harrietville (Mosier and Williams 2002:242–248).

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).

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 window pane–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).

Supporting Communities

The Treadwells planned several communities (Tesla, Jimtown, Frytown Treadwell Row, and Harrietville) for the workers of their industrial operations, and others such as Carnegie and Harrisville appear to have grown as new workers moved into the area. The planned communities appear to have been socially stratified; senior management resided at Treadwell Row, families in Harrietville, and mid-level mining personnel at Jimtown, with others living at Frytown or in the barracks at Tesla.

Tesla was named for the famous electrical scientist Nikola Tesla, Jimtown was named for James Treadwell, and Frytown was named after company director and president Robert D. Fry. All of these communities were out of sight and earshot of the mine's industrial activities. Harrietville, the largest of the residential communities, was located farther downstream; it was probably named for Harriet Isaac, an early local resident. The ethnocentrically named enclave of Chinatown was located directly across the creek from the mine and was first occupied by Chinese and Japanese laborers. When a large number of African American men arrived, the location was subsequently renamed "Darktown" (Mosier and Williams 2002:98–100). Harrisville grew during the early coal operations and appears to have been started around 1873. The community was composed mostly of Welsh miners and had the only school in the area.

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; however, the Graner Hotel, bakery, Carnegie Brick and Pottery Works, and the Pottery Works were all located in the planning area. California Historical Marker No. 740, located at the entrance to Carnegie SVRA, states:

> 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.

Mosier and Williams (2002) indicate that the population of 3,500 probably included all inhabitants of the canyon, and that the population of Carnegie was probably closer to 350.

The Treadwell operations collapsed after a series of floods, 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.

Efforts by the Beckman and Linden Engineering Corporation to revive the coal mine in 1918 failed, as did similar efforts in the 1950s. After the Tesla era, smaller companies such as the Livermore Clay and Sand Company and the Alameda Clay Corporation operated in the late 1920s at the Ryan Ranch clay deposit. Other ventures included the McNeal Clay Mine, which operated for a short period during the early 1930s; and the Tesla Clay Company, which mined surface and near-surface clay along unnamed drainages. Then, between the 1940s and 1960s, the Tesla Clay Sand Company, Tesla Sand and Clay Company, and Lowrie Paving Company all operated short-lived sand and clay mines.

Water and Power Generation (Early 20th Century)

Beginning in the late 1920s, the San Francisco Public Utilities Commission began construction of a massive water project designed to bring water from the Hetch Hetchy Valley in Yosemite National Park to San Francisco. Part of this effort involved constructing the Coast Range Tunnel, located along the southern boundary of the planning area. An access shaft for this tunnel and the associated Mitchell camp were established during construction. The transmission line associated with the Hetch Hetchy hydroelectric power network also traverses the planning area.

Ranching (Late 1800s to Present)

The first ranching/livestock 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 Treadwell 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. It was not until 1970 when John Brillisour, Lee Peterson, and others purchased the Carnegie property and established the Carnegie Cycle Park. In 1979 the State of California purchased the original SVRA using OHV Trust Funds and it continues to be used as an OHV recreation center today. Although currently closed to OHV use, the expansion area was purchased in 1998 by the State of California (ASC 2010:31).

2.3.4 Aesthetic Resources

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.

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 2-16) illustrates a typical view experienced by a driver on Corral Hollow Road, and Viewpoint 2 (Figure 2-16) shows Corral Hollow Road from the original Carnegie SVRA. Viewpoint 3 (Figure 2-17) 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 original 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 a few 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 original Carnegie SVRA, with Corral Hollow Road and LLNL Site 300 beyond.

Figure 2-16. 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 in the expansion area, facing across the Central Valley with the Sierra Nevada in the background.

Figure 2-17. Representative Photographs

VIEWS IN THE PLANNING AREA

VISUAL RESOURCES AND SCENIC CHARACTERISTICS

The planning area includes both the original Carnegie SVRA and the expansion area. The original Carnegie SVRA is generally open to the public, with the exception of certain areas that are closed for resource conservation purposes. The expansion area is not currently available for public use. 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 original 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 2-17) illustrates a long view with the Sierra Nevada in the background; Viewpoints 5 and 6 (Figure 2-18) illustrate views of the canyon from the planning area, and Viewpoint 7 (Figure 2-19) illustrates an area along upper Corral Hollow Creek.

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 2-18) illustrates graveled event areas in the original Carnegie SVRA in the middle ground. Hillsides in the original Carnegie SVRA have visible motorcycle tracks in areas where OHV recreation is not confined to specific trails. Viewpoint 8 (Figure 2-19) illustrates hillsides with visible motorcycle tracks in the original 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 either the Central Valley or the Livermore Valley.

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

Viewpoint 6: View of the top of the grade on Tesla Road from the expansion area.

Figure 2-18. Representative Photographs

Viewpoint 7: View of upper Corral Hollow Creek near the Tesla Coal Mine, with tailing area at right, in the expansion area.

Viewpoint 8: View of a typical north-facing slope on the site of the original Carnegie SVRA.

Figure 2-19. Representative Photographs

2.3.5 SOUND

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.

EXISTING SOUND ENVIRONMENT

Local traffic and OHV operations at the original 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 2-20) to quantify existing noise conditions during less busy weekday times and busier weekend times (with more OHV activity).

MEASUREMENT LOCATION 1

This location is near the southeast corner of the planning area, by the intersection of SRI Road and the SVRA's boundary fence. There is a limited view of other development in the area from this location. The nearest facilities, research labs, are approximately 1,000 feet south of this location; however, these facilities are not visible because of shielding from topography and trees. The noise environment is characterized by both natural sounds (e.g., birds, light wind) and human-made sounds (i.e., OHVs on nearby park trails). Ambient sound levels during the night when no OHV use was occurring were in the range of 34–58 dB hourly L_{eq}, with an average hourly noise level of 49 dB L_{eq}.

Measured sound levels during the weekend during typical hours of maximum OHV use (8 a.m.–6 p.m.) ranged from 35 to 55 dB hourly L_{eq}, with an average hourly noise level of 48 dB L_{eq}.

MEASUREMENT LOCATION 2

Location 2 is at Tyson's Basin at the day-use area between the SVRA's maintenance yard and the ranger station within the original Carnegie SVRA. Corral Hollow Road is visible from this location, but is approximately 600 feet to the north. The sound environment at this location is characterized by both natural sounds (e.g., birds, light wind) and human-made sounds mainly from OHVs traveling on nearby park trails. Ambient sound levels during the night when no OHV use was occurring were in the range of 36–59 dB hourly L_{eq}, with an average hourly noise level of 52 dB L_{eq}. During typical hours of OHV activity on Saturday and Sunday (i.e., 8 a.m.–6 p.m.), the noise levels at this location ranged from 48 to 70 dB hourly L_{eq}, with an average hourly noise level of 65 dB L_{eq}.

MEASUREMENT LOCATION 3

This measurement location is at a residential property (16961 Tesla Road) located in the northwest corner of the original Carnegie SVRA, south of Tesla Road. The residence is set back into the hillside with a limited view of other development in the area. The sound environment is characterized by natural sounds (e.g., birds, light wind) and some human-made sources, typically traffic on Tesla Road and OHV use in the SVRA. During typical hours of weekend OHV activity (i.e., 8 a.m.–6 p.m.), noise levels ranged from 39 to 74 dB hourly L_{eq}, with an average hourly noise level of 59 dB L_{eq}. Ambient sound levels during the night when no OHV use was occurring were in the range of 35–56 dB hourly L_{eq}, with an average hourly noise level of 47 dB L_{eq}.

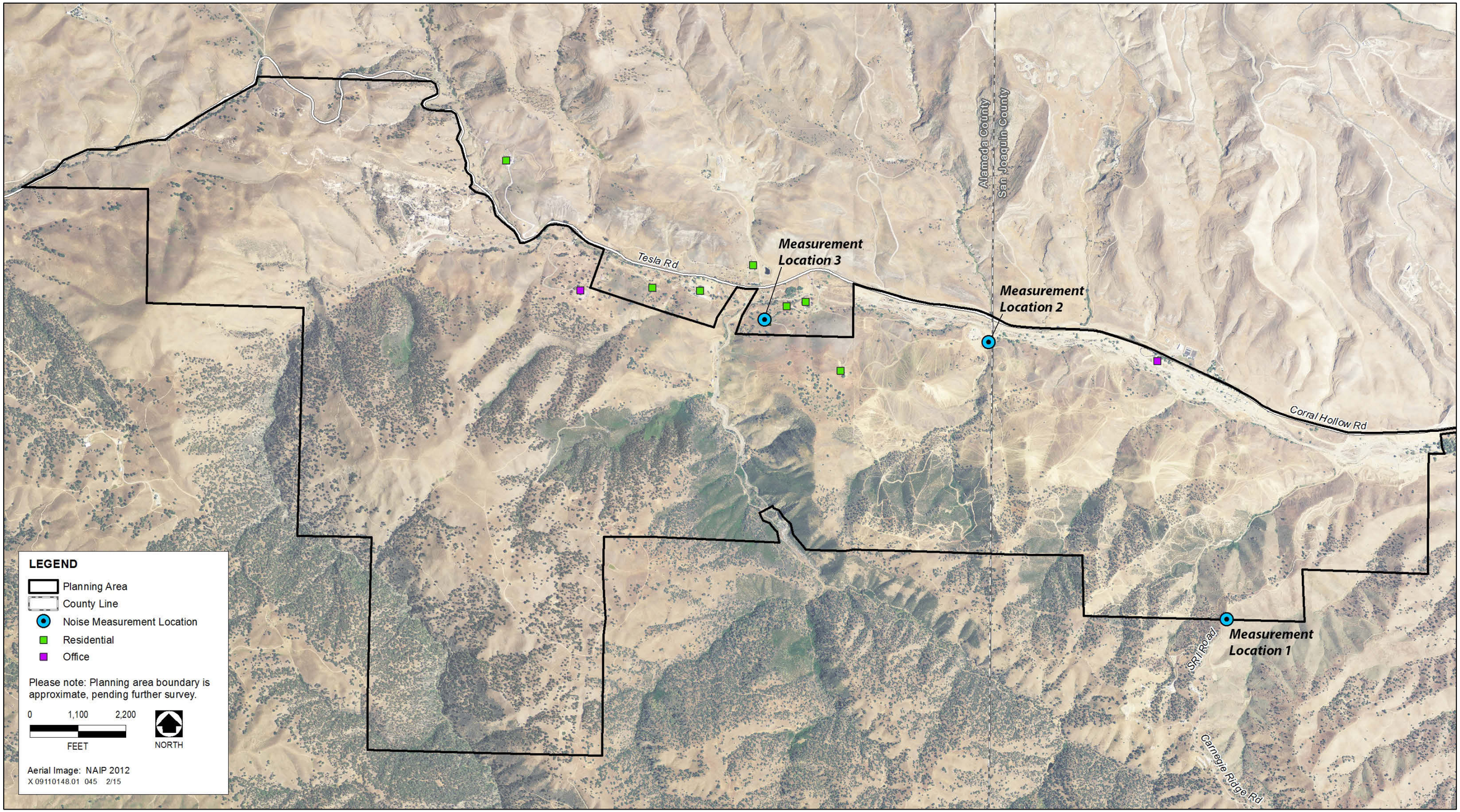
EXISTING NOISE-SENSITIVE LAND USES

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 original SVRA boundary. One permanent residence typically occupied by one SVRA staff member (and family) is located in the planning area. 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.

2.4 OPERATIONS AND MAINTENANCE

2.4.1 FACILITY MANAGEMENT

Carnegie SVRA and Twin Cities 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 original Carnegie SVRA and at other SVRAs with similar facilities and climates, Carnegie SVRA is estimated to require approximately 5.9 million gallons of



Source: State Parks data compiled by AECOM in 2013

Figure 2-20. Noise Measurement Locations

potable water per year, and approximately 8.4 million gallons of nonpotable water per year for such functions as irrigation and dust suppression. Water is supplied by on-site wells.

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 resurfacing 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.

STAFFING

Carnegie SVRA currently employs 16 full-time employees and 14–16 seasonal employees. With the expansion and full buildout of anticipated improvements, the OHMVR Division anticipates needing an additional seven full-time employees and seven to eight 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, no more than 12 staff members will be on-site at a time. The interpreter and environmental scientist work throughout the SVRA and occupy office space in the Carnegie Sector office. Staffing levels increase as needed during special events.

2.4.2 PUBLIC SAFETY

SPPOs patrol the SVRA 7 days a week and provide all public safety functions. Two SPPOs live in state housing on-site and are available to respond to emergencies in the area when notified by a sheriff's office, 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 LAFCO 2012a:13).

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. The sheriff's department applied for a 2014–2015 OHV Trust Fund Law Enforcement grant from State Parks' OHMVR program. If approved, the grant project will target the illegal use of OHVs and direct them to legal areas of OHV recreation, such as Carnegie SVRA (San Joaquin County 2014).

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.

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. Most of the planning area is within the High Fire Hazard Severity Zone, except that a portion located along Corral Hollow Road/Tesla Road lies within the Moderate Fire Hazard Severity Zone (CAL FIRE 2007a, 2007b).

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 original 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 2012b: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. The north-to-south SRI Road, which is closed to the public, provides access to the SRI property from Corral Hollow Road, crossing 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.

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.

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 three times per week and reach up to 1,000 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.

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.

INTERPRETIVE AND MUSEUM COLLECTIONS

The following interpretive materials are currently available at Carnegie SVRA:

- Taxidermied 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.

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. For this reason, information regarding OHV use and environmental responsibility is an important component of education at this park unit. Although special cultural and natural resources are present in the planning area, other very

similar areas also provide interpretation and education about these topics. For instance, the Tesla Coal Mine Site is of a similar type and age as the Black Diamond Mines, which are part of EBRPD. This regional preserve, located in Antioch, tells the story of coal and sand mining in the region. EBRPD provides interpretive tours of the Black Diamond Mines for the public.

2.5.3 Support for Interpretation and Education

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

2.5.4 Interpretation Issues, Opportunities, and Constraints

Many exciting opportunities exist to develop additional interpretive programs when the expansion area is open to the public. The expansion area contains the site of the former Tesla Coal Mine and several historic townsites. There are also some Native American artifacts and evidence of past use. These resources are not currently being interpreted to the public and could provide additional educational opportunities. 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.

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* members work closely with SVRA staff members on rehabilitation projects to help ensure that rerouting and design of trails meets the recreational interests of the public. Members also help educate the OHV community on resource protection and trail maintenance/design.
- *Carnegie Forever* is an organization made up of OHV recreationists and others interested in Carnegie SVRA that promotes sustainable use of the SVRA.

2.7 PLANNING INFLUENCES

2.7.1 Systemwide Planning

A variety of factors must be considered when making planning decisions for an SVRA. To understand land use, resource, and facility issues in a larger context, planning for an SVRA must consider issues that cross regional, local, and park boundaries. Therefore, the OHMVR Division 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
- Declaration of Purpose, Carnegie SVRA

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.

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.

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.

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.

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.

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 2009b). 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.

CALIFORNIA PUBLIC RESOURCES CODE

California Public Resources Code (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; 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.

PRC Section 5090.43(a) states:

> State vehicular recreation areas shall be established on lands where there are quality recreational opportunities for off-highway motor vehicles and in accordance with the requirements of Section 5090.35. Areas shall be developed, managed, and operated for the purpose of making the fullest public use of the outdoor recreational opportunities present. The natural and cultural elements of the environment may be managed or modified to enhance the recreational experience consistent with the requirements of Section 5090.35.

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.

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 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 parks managed by the OHMVR Division, 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 California OHV Trust Fund, including all SVRAs. In the context of the Soil Standard and the PRC, "restoration" means restoration of land to the contours, the plant communities, and the plant covers comparable to those on surrounding lands or to those that existed before OHV 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.

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.

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.

OFF-HIGHWAY MOTOR VEHICLE RECREATION DIVISION RESOURCE MANAGEMENT PROTOCOLS

The HMS (plans prepared by the OHMVR Division) and the Wildlife Habitat Protection Program (mandated by PRC Section 5090.35) are a major part of each SVRA's resource monitoring and evaluation program. The HMS 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 Wildlife Habitat Protection Program are to monitor and manage wildlife and plant populations and restore habitats where necessary to sustain a viable species composition within each SVRA. The plans enable 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 HMS and other monitoring protocols. Biological resource assessments conducted at Carnegie SVRA have been compiled according to the guidelines set forth by this system.

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 original 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 2-21 shows land uses as designated by the general plans of Alameda and San Joaquin Counties.

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 as a U District. This district includes all unincorporated territory of the county not located in any other district. Every use not otherwise prohibited by law is a conditional use in a U District, and may be permitted only if approved by the board of zoning adjustments. Existing uses may continue (Alameda County 2013:Chapter 17.50).

The expansion area is zoned as an Agricultural District. This district was established to promote implementation of *Alameda County 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 (Alameda County 2013:Chapter 17.06).

SAN JOAQUIN COUNTY

GENERAL PLAN

San Joaquin County is currently updating its entire general plan (San Joaquin County 2013). 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 2-21).

The Community Development section in *San Joaquin County General Plan* Volume III notes that Carnegie SVRA is one of 11 regional parks. The SVRA contains more parkland than the other regional parks combined, and is the county's only "motorcycling" recreational facility (San Joaquin County 1992:II.E-21, II.E-31).

In 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 (San Joaquin County 2011). Carnegie SVRA is included in the P-F (Public Facilities) Zone, which provides for the establishment of the following types of facilities and areas:

- Major correctional, medical, and infrastructure facilities
- Publicly owned recreation facilities and areas and similar facilities and areas
- Educational facilities meeting state requirements for primary, secondary, and higher education
- Police and fire protection facilities
- Public facilities and supporting uses in areas where they are most likely to benefit San Joaquin County residents

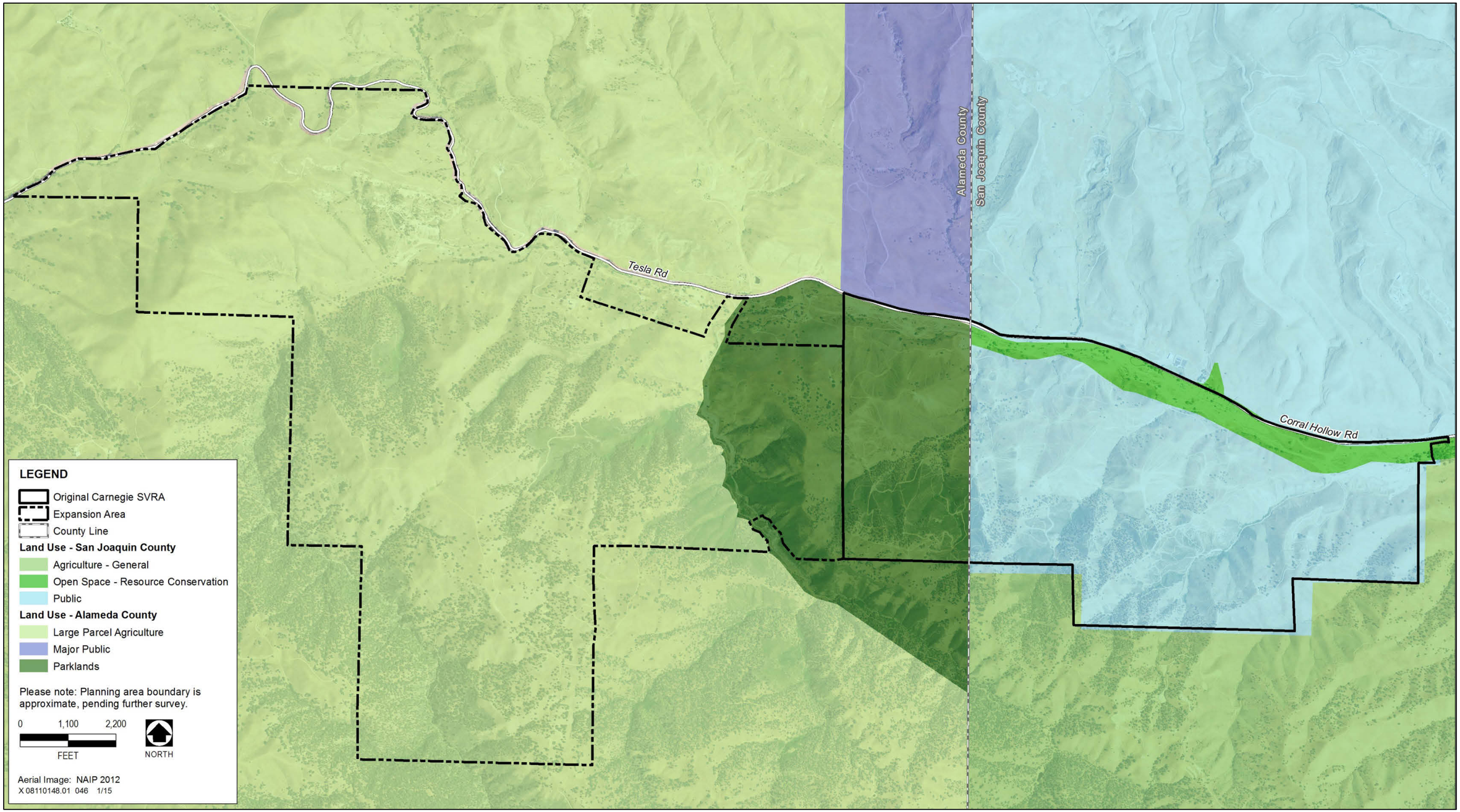
The P-F Zone implements the Public Facilities land use category of the *San Joaquin County General Plan.*

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 July 18, 2013, and covers the time period through 2040 (One Bay Area 2013).

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: San Joaquin County 2009; Alameda County 2002; data adapted by AECOM in 2014

Figure 2-21. County-Designated Land Uses in and near the Planning Area

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:* Navigable waters of the United States; interstate waters; all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce; tributaries to any of these waters; and many wetlands.

- *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 traditional navigable waters, must directly abut relatively permanent waters, or must have a significant nexus with a traditional navigable water.

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.

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.

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 (Order 2009-0009-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 is 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 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. 2003-0005-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. It is the position of the OHMVR Division that the planning area fits within the nontraditional small MS4 program.

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 (2011) 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 2011) 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 the 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 for State Parks by Salix and Geosyntec in 2011. 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. 2003-0005-DWQ, General Permit No. CAS000004, WDRs for Storm Water Discharges from Small MS4s, adopted on April 30, 2003. 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. The 2008 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 2008:1).

The guidelines in the Soil Standard provide tools and techniques that may be used to meet the 2008 standard. The guidelines were developed with input from representatives from State Parks' OHVMR 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 the intent of the OHMVR Division to develop the expansion area and continue to operate the original 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 2010* (San Joaquin County 1992:V-5, VI-24, VI-26) related to hydrology and water quality are to protect people and property from flood hazards (Public Health and Safety Element Objective 1 and related policies) and protect groundwater basins of the county from further overdraft (Resources Element Objective 3 and related policies). Corral Hollow Creek is identified as a "substantial groundwater recharge area" in Figure VI-6.

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* and 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.

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 postearthquake 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. 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 Seismic Hazards Zonation 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 2009-0009-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 the OHMVR Division to develop the expansion area and continue to operate the original 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 2010* (San Joaquin County 1992:V-3, VI-37) related to geology, soils, minerals, and paleontological resources are to reduce the risk to life and property and increased governmental cost from potential seismic occurrences, and to minimize the adverse economic, social, and physical impacts from geologic hazards (Public Health and Safety Element Objective 1, and Objective 2 and related policy); and to protect San Joaquin County's valuable architectural, historical, archaeological, and cultural resources (Resources Element Objective 1 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.

AIR QUALITY REGULATIONS

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.

State Regulations and Laws

California Air Resources Board

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

Among ARB's other responsibilities are overseeing local air districts' compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, 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 and local air pollution control districts are developing plans to meet new national air quality standards for ozone and $PM_{2.5}$. California's adopted 2007 State Strategy was submitted to EPA as a revision to the SIP in November 2007 (ARB 2012).

California Off-Highway Vehicle Regulations

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. 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).

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.

Regional Regulations and Ordinances

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 implements a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. 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 current version of BAAQMD's CEQA guidelines, *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, was released in December 1999 (BAAQMD 1999). This advisory document provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. In June 2010 BAAQMD adopted updated CEQA guidelines that included new quantitative thresholds for construction-related emissions of criteria air

pollutants and precursors, TACs, and greenhouse gases (BAAQMD 2010). In March 2012, the Alameda County Superior Court issued a judgment finding that BAAQMD's 2010 CEQA guidelines were a project under CEQA and that BAAQMD had not complied with CEQA as part of its adoption process. Therefore, at the time of this writing, BAAQMD is not recommending the use of the 2010 CEQA guidelines' updated thresholds to evaluate air quality impacts. (The methods and background information provided in BAAQMD's 2010 CEQA guidelines can still be applied to current projects.)

The issues discussed in the court order are not relevant to the question of whether BAAQMD's analysis provides substantial evidence in support of the proposed thresholds. State Parks agrees that the thresholds are supported by substantial evidence, and thus has elected to make use of BAAQMD's 2010 CEQA guidelines and thresholds.

BAAQMD Air Quality Plans

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 September 15, 2010, the BAAQMD Board of Directors adopted the final Bay Area 2010 Clean Air Plan, an update to the *Bay Area 2005 Ozone Strategy*. The 2010 Clean Air Plan describes current conditions and reviews the SFBAAB's progress in reducing ozone levels to attain the state 1-hour and 8-hour ozone standards. It also describes how the SFBAAB's proposed control strategy fulfills the CCAA's planning requirements for the state 1-hour ozone standard, and its mitigation requirements for transport of ozone and ozone precursors to neighboring air basins. The control strategies include:

- stationary-source control measures, to be implemented through BAAQMD regulations;
- mobile-source control measures, to be implemented through incentive programs and other activities; and
- transportation control measures, to be implemented through programs operated in cooperation with the MTC, local governments, and transit agencies.

BAAQMD Rules and Regulations

BAAQMD is responsible for limiting the amount of emissions that stationary sources can generate 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 stationary emissions sources are subject to BAAQMD's rules governing operational emissions. Some sources are subject to further regulation through BAAQMD's permitting process. Through this process, BAAQMD monitors the levels of stationary-source emissions generated and uses this

information to develop the clean-air plan. The following are the primary BAAQMD rules applicable to the General Plan:

- *Regulation 2, Rule 1:* General Permit Requirements
- *Regulation 6:* Particulate Matter and Visible Emissions
- *Regulation 7:* Odorous Substances
- *Regulation 8, Rule 15*: Emulsified 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.

SJVAPCD Guide for Assessing and Mitigating Air Quality Impacts

In January 2002, SJVAPCD released a revision to its previously adopted guidelines document. This revised *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2002) 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 CCAA also 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.

The *2007 Ozone Plan* was adopted by SJVAPCD in April 2007 and approved by ARB in June 2007. The plan was prepared to enable the district to expeditiously attain the national 8-hour ozone standard. The plan contains an exhaustive list of regulatory and incentive-based measures to reduce emissions of ozone precursors and particulate matter in the region. The plan's proposed local measures to achieve

attainment of the 8-hour ozone standard were adopted before 2012 as projected in the *2007 Ozone Plan* (SJVAPCD 2010). The plan noted that NO_X emissions would need to be reduced by 75 percent (i.e., 624 tons per day) from 2005 levels to achieve the new ozone standard (SJVAPCD 2007).

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 *2007 Ozone Plan*. Based on future technology and full implementation of the proposed control measures, the plan estimates that 90 percent of the SJVAB will be in attainment by 2020 (SJVAPCD 2007). SJVAPCD is developing a national 8-hour ozone plan to address its extreme nonattainment status. That plan is due to EPA in 2015.

In December 2012, SJVAPCD adopted its *2012 $PM_{2.5}$ Plan*, which replaces the *2008 $PM_{2.5}$ Plan.* The updated plan, approved by ARB in January 2013, addresses EPA's 24-hour standard of 35 micrograms per cubic meter. Like the 2008 plan, the 2012 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 plan anticipates that with continued implementation of measures from previous plans along with the measures in the new *2012 $PM_{2.5}$ Plan*, the SJVAB will attain the 1997 $PM_{2.5}$ annual standard by 2015 and the new 2006 24-hour standard by 2019 (SJVAPCD 2012).

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 applicable to the proposed expansion 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

- *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
- *Rule 9110*—General Conformity
- *Rule 9510*—Indirect Source Review

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.

The rule is applicable to any applicant (any person or entity that undertakes a development project) that, upon full buildout and for retail/commercial uses, has a project encompassing 2,000 square feet or more. Therefore, the rule is applicable to the proposed expansion of Carnegie SVRA.

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. Rule 9510 requires that construction exhaust emissions 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 Contaminant Regulations

Air quality regulations also focus on TACs, or in federal terminology, hazardous air pollutants. In general, for TACs that may cause cancer, no concentration exists that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected. This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and ambient standards have been established. EPA and ARB regulate TACs through statutes and regulations that generally require using the maximum available control technology or best available control technology (BACT) for toxics to limit emissions. These statutes and regulations, in conjunction with rules set forth by BAAQMD and SJVAPCD, establish the regulatory framework for TACs.

Federal

Title III of the CAA requires EPA to promulgate national emissions standards for hazardous air pollutants for certain categories of sources that emit one or more pollutants identified as hazardous air pollutants/TACs. Emission standards may differ between "major sources" and "area sources" of TACs. Major sources are defined as stationary sources with the potential to emit more than 10 tons per year of any TAC or more than 25 tons per year of any combination of TACs; all other sources are considered area sources.

The CAAA required EPA to promulgate vehicle or fuel standards containing reasonable requirements to control TAC emissions, applying at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAA required the use of reformulated gasolines in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions, including TACs.

State

TACs in California are regulated primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588), also known as the Hot Spots Act. AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review are necessary before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of hazardous air pollutants as TACs. Most recently, diesel particulate matter was added to ARB's list of TACs.

Once a TAC is identified, ARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If there is a safe threshold at which there is no toxic effect from a substance, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emissions inventory and a health risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel-exhaust control measures and stringent emission standards for various on-road mobile sources of emissions. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, diesel particulate matter) declined substantially over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., low-emission vehicle/clean fuels and Phase II reformulated gasoline regulations) and control technologies. ARB's Diesel Risk Reduction Plan aims to reduce diesel particulate matter concentrations by 85 percent in 2020 from the estimated year-2000 level. As emissions are reduced, risks associated with exposure to the emissions likely will also be reduced. Emissions from heavy-duty diesel equipment in the planning area would be required to comply with the rules outlined above.

ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* provides guidance on land-use compatibility with TAC sources (ARB 2005). Although not a law or adopted policy, the handbook offers recommendations for the siting of sensitive receptors (such as proposed residential units) near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help limit the exposure of children and other sensitive populations to TACs. The handbook is used to assess how much exposure would occur as a result of project implementation.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under BAAQMD Rule 2-1 (General Permit 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. Similarly, SJVAPCD has developed Rule 201 (General Permit Requirements), Rule 2020 (New Source Review), and Rule 211 (Maximum Available Control Technology at Major Sources of Hazardous Air Pollutants) to permit and track the emissions of TAC emissions within its jurisdiction. Both air districts specify that permits may be granted if the sources are constructed and operated in accordance with applicable regulations, including new-source-review standards and air toxics 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

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

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. The local air districts have the authority over stationary or industrial-type sources. 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

Federal and State

There are no federal or state regulations related to odors. Odors are typically considered a local air quality problem. The regional regulatory framework for odors is discussed below.

Region

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.

Greenhouse Gas Emissions Regulations

Federal Regulations and Laws

Supreme Court Ruling on California Clean Air Act Waiver

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. However, no federal regulations or policies regarding GHG emissions are applicable to General Plan implementation. See the discussion of AB 1493 under "State Plans, Regulations, and Laws," below, for further information about the CCAA waiver.

Energy Independence and Security Act of 2007 and Corporate Average Fuel Economy 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 most important amendment statutorily mandated that the National Highway Traffic Safety Administration set passenger-car corporate average fuel economy (CAFE) standards for each model year at the maximum feasible level. This statutory mandate also eliminated the old default CAFE standard of 27.5 miles per gallon. The EISA required that CAFE standards for model years 2011–2020 be set sufficiently high to achieve the goal of an industrywide average CAFE standard of 35 miles per gallon for passenger cars and light-duty trucks.

At the request of President Barack Obama, the rulemaking for this goal was divided into two parts. The first part, published in the *Federal Register* in March 2009, included CAFE standards for model year 2011 to meet the statutory deadline (March 30, 2009). The second part of the rulemaking, applicable to model year 2012 and subsequent years, set the maximum CAFE standards feasible under the limits of the Energy Policy and Conservation Act and EISA. In April 2010, the National Highway Traffic Safety

Administration and EPA issued a Final Rule that established national standards for model year 2012–2016 passenger cars and light trucks. In addition, in August 2012, the same agencies issued another Final Rule for model years 2017–2025 (EPA 2013b).

Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Federal Clean Air Act

On December 7, 2009, EPA adopted its *Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases*, known as the Endangerment Finding, under the CAA. The Endangerment Finding is based on CAA Section 202(a), which states that the EPA Administrator should regulate and develop standards for "emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."

The rule addresses CAA Section 202(a) in two distinct findings. The first addresses whether the concentrations of the six key GHGs (CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the health and welfare of current and future generations. The second addresses whether the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs, and thus to the threat of climate change.

The EPA Administrator found that atmospheric concentrations of GHGs endanger public health and welfare within the meaning of Section 202(a) of the CAA. The EPA Administrator also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare.

State Regulations, and Laws

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed AB 1493. AB 1493 required that ARB develop and adopt by January 1, 2005, regulations that would achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, in 2004 ARB approved amendments to the California Code of Regulations that added GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to 13 CCR Sections 1900 and 1961 and adoption of Section 1961.1 imposed new requirements on automobile manufacturers, beginning with model year 2009. The manufacturers were required to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger-vehicle weight classes. (These weight classes applied to any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons.) For passenger cars and light-duty trucks with a loaded vehicle weight of 3,750 pounds or less, the GHG emission limits for model year 2016 are

approximately 37 percent lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with a loaded vehicle weight of 3,751 pounds to a gross vehicle weight of 8,500 pounds, and for medium-duty passenger vehicles, the regulations called for GHG emissions to be reduced approximately 24 percent between 2009 and 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of 13 CCR Sections 1900 and 1961, as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al.*). The automakers' suit, in the U.S. District Court for the Eastern District of California, contended that California's implementation of regulations that would effectively regulate vehicle fuel economy violated various federal laws, regulations, and policies.

On December 12, 2007, the court rejected the automakers' claim, finding that if California were to receive appropriate authorization from EPA (the last remaining factor in enforcing the standard), then these regulations would be consistent with and have the force of federal law. This authorization to implement more stringent standards in California was requested in the form of a CAA Section 209(b) waiver in 2005. EPA subsequently failed to act on granting California authorization to implement the standards, and then-Governor Arnold Schwarzenegger and then–Attorney General Edmund G. Brown Jr. filed suit against EPA for the delay. In December 2007, EPA Administrator Stephen Johnson denied California's request for the waiver to implement AB 1493. Johnson cited the need for a national approach to reducing GHG emissions, the lack of a "need to meet compelling and extraordinary conditions," and the emissions reductions that would be achieved through the EISA as the reasons for the denial (Office of the White House 2009).

The State of California filed suit against EPA for its decision to deny the CAA waiver. The Obama Administration directed EPA to reexamine its position denying California's CAA waiver and opposing regulation of GHG emissions. California received the waiver on June 30, 2009.

Executive Order S-3-05

Executive Order S-3-05, signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, exacerbate California's air quality problems, and potentially cause a rise in sea level. To combat those concerns, the executive order established total GHG emission targets. Specifically, emissions were to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The executive order directed the Secretary of the California Environmental Protection Agency to coordinate a multiagency effort to reduce GHG emissions to the target levels. The Secretary must also submit biannual reports to the Governor and California Legislature describing progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat these impacts. To comply with Executive Order S-3-05, the Secretary of the

California Environmental Protection Agency created the California Climate Action Team, consisting of members of various state agencies and commissions. The climate action team's first report, released in March 2006, proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, and state incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, Governor Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006. AB 32 established regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. Under AB 32, statewide GHG emissions must be reduced to 1990 levels by 2020. This reduction will be accomplished through a statewide cap on GHG emissions (i.e., cap-and-trade program) that was phased in starting January 1, 2012, with an enforceable compliance obligation beginning with 2013 GHG emissions.

AB 32 directs ARB to effectively implement the cap by developing and implementing regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

ARB is required to update the Scoping Plan at least once every 5 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 May 2014 (ARB 2014). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other state, federal, and local efforts to reduce GHG emissions in California from 2008 to 2013 with respect to the 2020 GHG reduction target. The Scoping Plan Update determined that the state is on schedule to achieve the 2020 target; however, an accelerated reduction in GHG emissions is required to achieve the 2050 reduction target.

Senate Bill 1368

Senate Bill (SB) 1368, the companion bill of AB 32, was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission to establish a GHG performance standard for base-load generation from investor-owned utilities by February 1, 2007. The California Energy Commission was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emission rate from a base-load combined-cycle natural gas–fired plant. The legislation further required that all electricity provided to

California, including imported electricity, be generated by plants that meet the standards set by the California Public Utilities Commission and California Energy Commission.

Executive Order S-1-07

Executive Order S-1-07, signed by Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at more than 40 percent of statewide emissions. It established a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. This order also directed ARB to determine whether it could adopt this Low Carbon Fuel Standard as a discrete early-action measure after meeting the mandates in AB 32. ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

Senate Bill 97

SB 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research to prepare, develop, and transmit to the California Natural Resources Agency by July 1, 2009, guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA. The California Natural Resources Agency adopted those guidelines on December 30, 2009, and the guidelines became effective March 18, 2010.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 required MPOs to adopt a sustainable communities strategy or alternative planning strategy prescribing land use allocation in that MPO's regional transportation plan. ARB, in consultation with the MPOs, would provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. (These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets.)

SB 375 also charged ARB with reviewing each MPO's sustainable communities strategy or alternative planning strategy for consistency with its assigned targets. If an MPO did not meet the GHG emission reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

This bill also extended the minimum time period for the regional housing needs allocation cycle from 5 years to 8 years for local governments located within an MPO meeting certain requirements. City or county land use policies (including general plans) need not be consistent with the regional transportation plan (and associated sustainable communities strategy or alternative planning strategy). However, new provisions of CEQA incentivize qualified projects that are consistent with an approved sustainable communities strategy or alternative planning strategy, categorized as "transit priority projects."

Assembly Bill 32, Climate Change Scoping Plan

On December 11, 2008 ARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which functions as a road map of ARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations (ARB 2008). The Scoping Plan contains the main strategies California will implement to reduce carbon dioxide equivalent (CO_2e) emissions by 169 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT CO_2e under a business-as-usual scenario. (This is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.)

The Scoping Plan also breaks down the amount of GHG emissions reductions that ARB recommends for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e),
- the Low Carbon Fuel Standard (15.0 MMT CO_2e),
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and
- a renewable portfolio standard for electricity production (21.3 MMT CO_2e).

In addition, with respect to the proposed expansion of Carnegie SVRA, the Scoping Plan cites the need for future efficiency strategies and low-carbon fuels for off-road vehicles; however, no defined GHG reductions or strategies were developed for these actions (ARB 2008).

Addressing Climate Change at the Project Level: California Attorney General's Office

In January 2010, the California Attorney General's Office released a document (*Addressing Climate Change at the Project Level*) to assist local agencies with addressing climate change and sustainability at the project level under CEQA (California Attorney General's Office 2010). The document provides examples of various measures that may reduce impacts related to climate change at the individual project level. As appropriate, the measures can be included as design features of a project, required as changes to the project, or imposed as mitigation (whether undertaken directly by the project proponent or funded by mitigation fees).

Regional and Local Regulations and Ordinances

Bay Area Air Quality Management District

In June 2010, BAAQMD adopted its updated CEQA air quality guidelines (BAAQMD 2010), which established quantitative GHG thresholds of significance. (See the description of these guidelines in the discussion of regional quality plans, rules, and regulations in the "Air Quality Regulations" section, above.)

BAAQMD's CEQA air quality guidelines include separate thresholds of significance for project- and plan-level analyses. At the project level, BAAQMD recommends that projects use a qualitative threshold of significance based on the project's consistency with a "qualified greenhouse gas reduction plan." In addition, project-level analyses can also be evaluated using two quantitative thresholds, the project's annual GHG emissions in metric tons CO_2e per year or its GHG efficiency in metric tons CO_2e per year per service population. A project's service population is defined by the number of employees and residents. At the plan level, BAAQMD recommends that projects be evaluated using a quantitative GHG efficiency threshold (similar to that for project-level analyses) and a qualitative threshold based on the plan's consistency with a "qualified greenhouse gas reduction plan."

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.

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 and unique archaeological 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.

Only significant cultural resources (e.g., "historical resources" and "unique archaeological 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.

California Public Resources Code

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

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 make a determination 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.

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 2-11 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.

Table 2-11. 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.
	$L_{eq(24)} \leq 55$ 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.
	$L_{eq(24)} \leq 45$ 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 1974:3

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.

STATE REGULATIONS AND LAWS

The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research, provides guidance for the compatibility of projects relative to environmental noise exposure levels (OPR 2003). 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 96 dB at 50 feet for vehicles manufactured in 1986 or later, while OHVs manufactured before 1986 cannot produce a maximum noise level exceeding 101 dB at 50 feet.

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 the OHMVR Division to develop the expansion area and continue to operate the original 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 nontransportation 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 Volume III of the *San Joaquin County General Plan,* in the Noise Element (San Joaquin County 1992:Section III.D). The Noise 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 stationary noise sources, the Noise 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. Noise 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.

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 OHMVR Division to develop the expansion area and continue to operate the original 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.

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 2-12 presents the characteristics associated with each LOS grade.

Table 2-12. Definitions of Level of Service

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
A	Uncongested operations; all queues clear in a single signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
B	Uncongested operations; all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow; presence of other vehicles noticeable.
C	Light congestion; occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
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. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow; speeds and ability to maneuver restricted.
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). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays; congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity; flow quite unstable.
F	Total breakdown; stop-and-go operation. Delay > 80.0 sec	Intersection may be blocked by external causes. Delay > 50 sec/veh	Forced flow; breakdown.

Notes: sec = seconds; sec/veh = seconds per vehicle

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.

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, the OHMVR Division intends to develop the expansion area and continue to operate the original 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 Resources section in Volume III of the *San Joaquin County General Plan* (San Joaquin County 1992: Section IV) 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

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, residents in Northern California think that OHV areas are important (State Parks 2009d).

About 20 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).

REGIONAL DEMOGRAPHICS

Alameda and San Joaquin Counties had a combined population of nearly 2.2 million people in 2010. The two cities closest to Carnegie SVRA are Livermore and Tracy, each with a population of about 80,000. According to the U.S. Census, Alameda County grew by about 5 percent between 2000 and 2010, while San Joaquin County grew by more than 21 percent and the city of Tracy grew by almost 46 percent (Table 2-13). According to California Department of Finance projections, it is estimated that San Joaquin County will continue to grow at high rates for the next 30 years.

Alameda County is predominantly white, Asian, and Hispanic while San Joaquin County is primarily white and Hispanic (Table 2-14). As described previously, Hispanic participation rates in OHV recreation have increased in the past few years. The Hispanic population is projected to increase in both counties, almost doubling in San Joaquin County (Table 2-15).

Table 2-13. City and County Population Growth

City/County	2000	2010	2040	% Increase (2000–2010)	% Increase (2010–2040)
Livermore	73,345	80,968	NA	10.4%	NA
Tracy	56,929	82,922	NA	45.7%	NA
Alameda County	1,443,741	1,510,271	1,678,565	4.6%	11.1%
San Joaquin County	563,598	685,306	1,213,708	21.6%	77.1%

Note: NA = not available

Sources: U.S. Census Bureau 2000a, 2000b, 2000c, 2000d, 2010a, 2010b, 2010c, 2010d, 2014a, 2014b; DOF 2013a, 2013b

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 2010 U.S. Census recorded median ages of 36.6 and 32.7 years for the two counties (U.S. Census Bureau 2000a, 2000b, 2010a, 2010b).

Table 2-14. Race/Ethnicity in Alameda and San Joaquin Counties in 2012

Race/Ethnicity	Alameda County	%	San Joaquin County	%
Not Hispanic or Latino:	1,175,695	77.6%	420,228	61.2%
White	516,580	34.1%	246,851	35.9%
Black or African American	181,711	12.0%	46,941	6.8%
American Indian and Alaska Native	4,318	0.3%	2,939	0.4%
Asian	397,475	26.2%	96,169	14.0%
Native Hawaiian and Other Pacific Islander	12,442	0.8%	3,312	0.5%
Other	63,169	4.2%	23,946	3.5%
Hispanic or Latino	339,441	22.4%	266.808	38.8%
Total	**1,515,136**	**100.0%**	**687,036**	**100.0%**

Sources: U.S. Census Bureau 2014a, 2014b

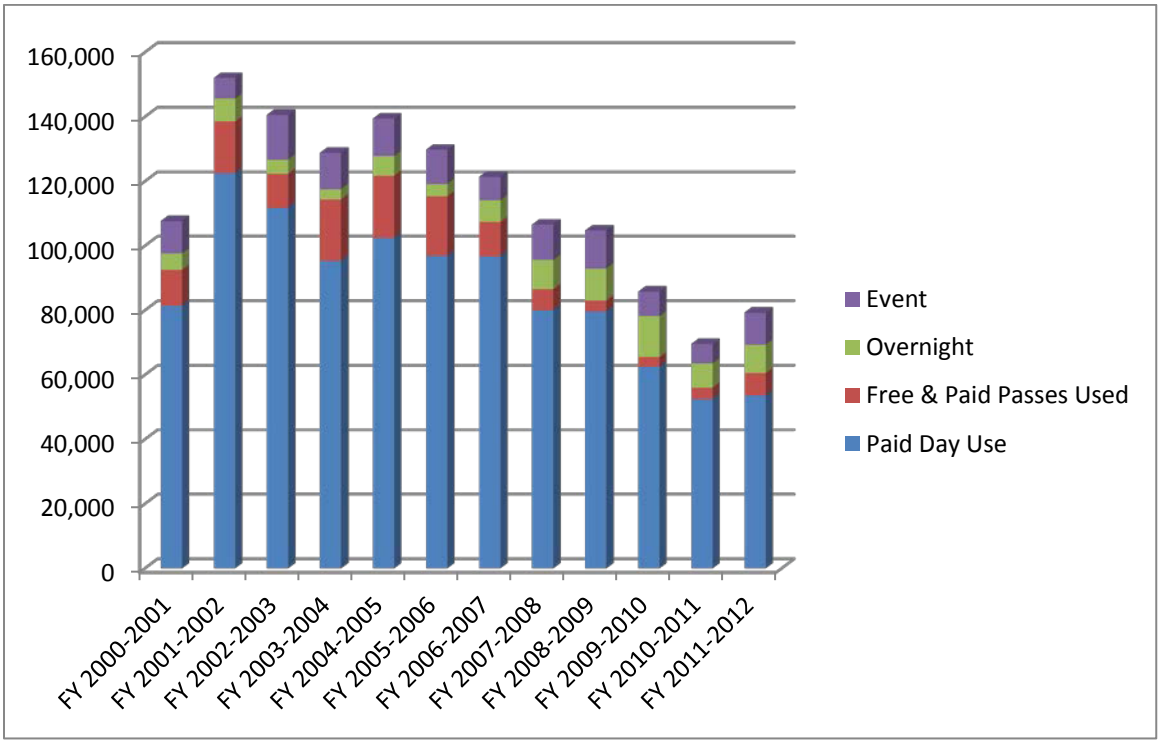
Table 2-15. Race/Ethnicity in Alameda and San Joaquin Counties in 2040

Race/Ethnicity	Alameda County	%	San Joaquin County	%
Not Hispanic or Latino:	1,211,517	72.2%	665,009	54.8%
White	428,479	25.5%	356,441	29.4%
Black or African American	180,230	10.7%	77,539	6.4%
American Indian and Alaska Native	3,915	0.2%	3,948	0.3%
Asian	481,391	28.7%	188,170	15.5%
Native Hawaiian and Other Pacific Islander	15,106	0.9%	3,556	0.3%
Other	102,396	6.1%	35,355	2.9%
Hispanic or Latino	467,048	27.8%	548,700	45.2%
Total	**1,678,565**	**100.0%**	**1,213,708**	**100.0%**

Sources: DOF 2013a, 2013b

CARNEGIE SVRA VISITATION

Over the last 10 years, Carnegie SVRA has hosted an average of 104,000 visits each year, with an additional estimated 10,000 coming for events each year. Attendance peaked in the early 2000s and stayed fairly steady until fiscal year 2007–2008, when a dropoff in attendance occurred (Figure 2-22). (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 year 2011–2012 show an increase in visitors, potentially the result of a recovering economy.



Source: Data provided by State Parks and adapted by AECOM in 2013.

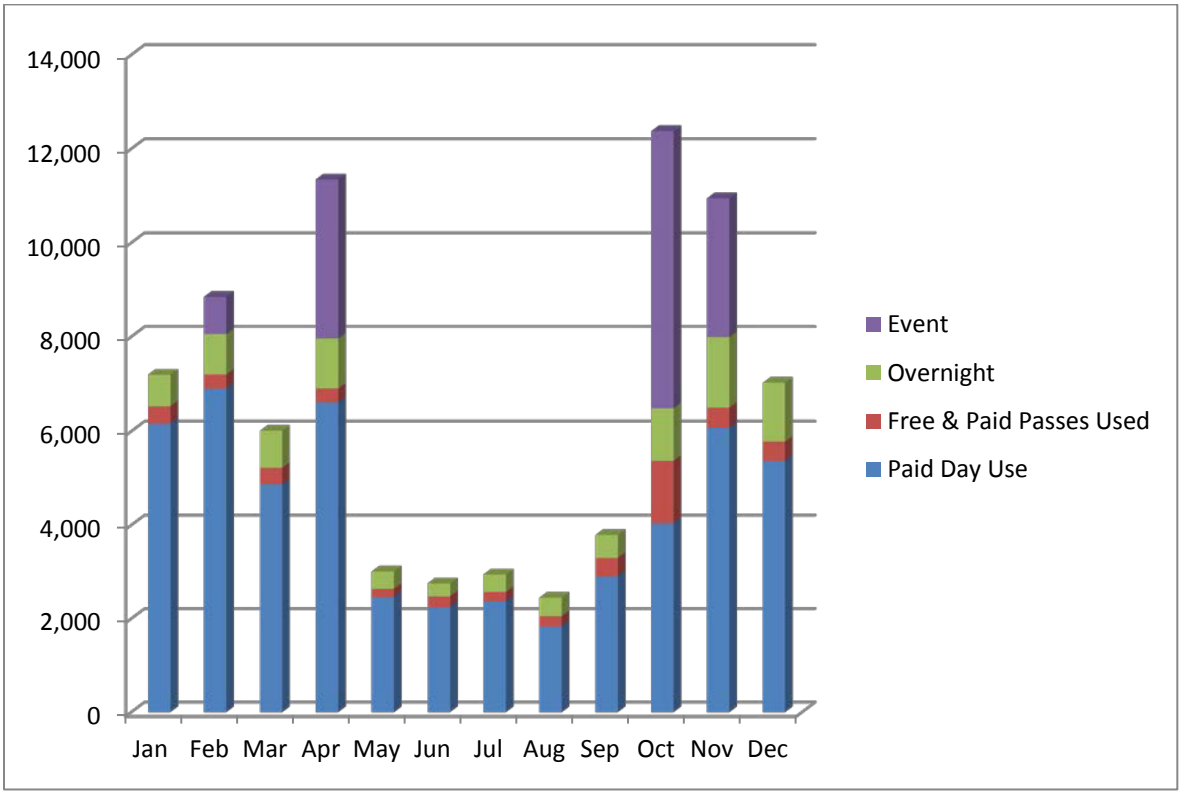
Figure 2-22. Attendance at Carnegie SVRA over Time, by Pass Type

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 2-23). 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).

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 are what led respondents to choose Carnegie SVRA over other OHV areas available to them.



Source: Caldera, pers. comm., 2013

Figure 2-23. Attendance at Carnegie SVRA by Month, 2012

2.7.5 FUTURE OPPORTUNITIES

A group enjoying the 4x4 challenge area

As described previously, most visitors come to Carnegie SVRA to ride off-highway motorcycles; however, there have been longstanding desires for an SVRA that would serve users of other OHV types. State Parks has tried to accommodate 4WD recreation with development of the 4x4 challenge area. Most of the original Carnegie SVRA is too steep for 4WD vehicles and ATVs. The expansion area provides an opportunity to provide recreation opportunities for users of other types of OHVs like 4WD vehicles and recreational OHVs (also known as side-by-sides).

The expansion area also provides an opportunity for State Parks to educate visitors about the natural and cultural resources.

CHAPTER 3 – ISSUES AND ANALYSIS

3.1 INTRODUCTION

This chapter details the planning assumptions and key issues that were identified during the planning process. Those assumptions and issues are addressed in Chapter 4 of this General Plan. Key issues were identified through research on existing conditions, public outreach efforts, interviews with local experts, and discussions with staff members from the Off-Highway Motor Vehicle Recreation (OHMVR) Division of State Parks.

3.2 PLANNING ASSUMPTIONS

The planning assumptions listed below are based on OHMVR Division policy, core program initiatives, statewide planning issues, and current federal and state laws. These assumptions provide the planning context and parameters for addressing General Plan issues for Carnegie State Vehicular Recreation Area (SVRA).

The OHMVR Division will do the following at Carnegie SVRA:

- Maintain and increase, where appropriate, the level of recreational opportunities for off-highway vehicles (OHVs) and motorized off-highway access; explore offering nonmotorized recreational opportunities, as appropriate.
- Manage Carnegie SVRA in a manner consistent with statutory and regulatory requirements that encourages responsible OHV recreation.
- Provide education and enforcement efforts that balance OHV recreational opportunities at Carnegie SVRA with programs that conserve and protect natural and cultural resources.
- Manage and protect rare, threatened, and endangered species and sensitive wildlife habitats, as required by federal and state laws.
- Consider the issues and concerns of adjacent landowners and residents during the planning and implementation process.
- Seek input from local, regional, and statewide interests.
- Coordinate with agencies and regional partners to manage water quality at the SVRA.
- Coordinate with agencies and regional and local partners on local issues such as air quality, water supply, water quality, and public utilities and services.
- Manage and protect historic-era and prehistoric resources as required by federal and state laws.

- Manage the SVRA's cultural resources, including historic-era structures and landscapes, following the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.
- Consult with California Native American Tribes and tribal communities and reach a mutually respectful understanding of the long-term need for protection and treatment of heritage sites, objects, or human remains; also, determine what level and type of consultation will be required during subsequent planning, design, and implementation projects.

3.3 ISSUES AND ANALYSIS

3.3.1 REGIONAL PLANNING CONTEXT

Air quality is an issue of regional concern in the San Francisco Bay Area and San Joaquin County. OHV use, like any other vehicular use, is a contributing factor. Vehicle emissions generated from travel to and from Carnegie SVRA and from recreation activities at the SVRA contribute to regional air pollution and climate change. Furthermore, constructing facilities and operating the SVRA could temporarily increase dust particulates in the air and contribute to local air pollution levels. The Carnegie SVRA General Plan includes goals and guidelines to reduce air pollution, greenhouse gas emissions, and releases of fugitive dust during construction and operation.

3.3.2 SVRA-WIDE ISSUES

SITE ACCESS

The original Carnegie SVRA has one main entrance and a few additional entrances for special purposes, including a special-event entrance and a public exit/entrance for the campground that is opened when the main SVRA entrance is closed. No direct road or trail currently connects the original Carnegie SVRA and the expansion area. Several gates provide access to the expansion area from Tesla Road/Corral Hollow Road. The Carnegie SVRA General Plan identifies four potential access points for the SVRA. These access points were selected to provide a range of potential ways to access the SVRA while maintaining safe conditions along Tesla Road/Corral Hollow Road.

VISITOR EXPERIENCE

Corral Hollow Canyon has been used for OHV recreation since the early 1940s. Off-highway motorcyclists have been the main users of the area, with less use by other OHV enthusiasts. The 1981 Carnegie SVRA General Plan stated that four-wheel-drive recreation was desirable, but could not be significantly accommodated within the original SVRA. State Parks has received many suggestions regarding additional recreation opportunities that the expansion area could accommodate, including OHV recreation facilities, nonmotorized recreation, and camping. The Carnegie SVRA General Plan includes visitor experience areas that offer increased recreation opportunities for OHV enthusiasts with a

broad range of interests and skills. The General Plan expands opportunities available for existing visitors and offers new opportunities for potential and underserved visitors.

RELATIONSHIPS WITH ADJACENT LANDOWNERS

Carnegie SVRA is located in Corral Hollow Canyon. Neighboring landowners include ranching operations, research facilities, agencies, and a few private residences. State Parks strives to maintain good relations with all of its neighbors and has invited them into the planning process as key stakeholders. Some of the neighbors have easements or other agreements with State Parks. State Parks will continue to engage with neighbors to facilitate positive interactions and to address common issues such as maintaining the water quality of Corral Hollow Creek. The Carnegie SVRA General Plan accommodates all existing easements and includes goals and guidelines for building and maintaining relationships with neighbors and other stakeholders.

PHYSICAL RESOURCE MANAGEMENT

STORMWATER MANAGEMENT/WATER QUALITY

The *Corral Hollow Watershed Assessment* was published in 2007. This assessment found that three sources contribute to the total suspended solids found in Corral Hollow Creek: erosion caused by OHV activities, historical mining activities in the expansion area, and off-site flows from Baker's Ravine. Since publication of the watershed assessment, State Parks has created and the Central Valley Regional Water Quality Control Board (RWQCB) has approved a stormwater management plan for the SVRA that includes site-specific structural and nonstructural best management practices aimed at reducing total suspended solids. State Parks staff members are working to implement these best management practices throughout the original Carnegie SVRA.

Other measures also have been implemented to improve local surface water quality, such as fencing off Corral Hollow Creek to limit vehicle access to designated crossings, and implementing the Mitchell's Ravine restoration project. Other projects currently planned include improvements to roads and drainage patterns that will be implemented in 2015. All of these projects and planning efforts have helped improve surface water quality at the SVRA.

Coordination with the Central Valley RWQCB is ongoing for all projects and was specifically conducted in support of the General Plan. The General Plan contains numerous goals and guidelines aimed at maintaining and improving water quality in the original Carnegie SVRA and to guide design and implementation of future projects envisioned in the General Plan to avoid adverse effects on water quality.

SOIL CONSERVATION

Soil conservation is a priority at Carnegie SVRA. The 2008 *Soil Conservation Standard and Guidelines* (State Parks 2008) require assessment, maintenance, and monitoring activities for all projects funded by

the OHV Trust Fund. These activities are undertaken so that all OHV facilities are managed for their sustainable prescribed use without causing the loss of soil that cannot be restored, and without causing erosion or sedimentation that significantly affects resource values.

Several soil types in the SVRA have high susceptibility to wind erosion, and many are susceptible to water erosion. As a result, these areas can contribute substantially to erosion and sediment mobilization. Staff members are engaging in assessment, maintenance, and monitoring activities consistent with the 2008 *Soil Conservation Standard and Guidelines* and the General Plan includes goals and guidelines aimed at protection and conservation of soil while maintaining a quality OHV recreational experience.

Aesthetic Resources

Several people have expressed concerns about the visual effect of OHV use as seen from Tesla Road/Corral Hollow Road. State Parks staff members are working to assess, maintain, and restore resource management areas in the original SVRA to address aesthetic issues. State Parks will assess the impacts of future uses on the aesthetics of the SVRA, and the General Plan includes goals and guidelines to reduce them.

Noise

Some stakeholders have expressed concern about noise levels from existing and potential OHV use at Carnegie SVRA. Concerns include the potential effects of noise levels on visitor experiences at cultural resource sites, the effect on local wildlife, and the effects of noise levels on neighbors. State Parks will assess noise levels during California Environmental Quality Act review as required by state law. The Carnegie SVRA General Plan includes goals and guidelines aimed at reducing noise impacts on sensitive receptors.

Fire Safety

Fire safety is a constant concern during dry California summers. The most recent nearby fire, in 2009, burned more than 12,500 acres in Corral Hollow Canyon and the adjacent hills. Some parts of Carnegie SVRA had to be closed for restoration because of fire damage. Fire prevention is an important management issue at Carnegie SVRA. State Parks requires that wildfire management plans be prepared for all state park units. State Parks should evaluate fire hazards and coordinate with local fire and safety agencies to address fire hazards with appropriate management techniques, including updating and finalizing the wildfire management plan. The General Plan includes goals and guidelines related to fire safety.

BIOLOGICAL RESOURCE MANAGEMENT

Carnegie SVRA is located within and contains U.S. Fish and Wildlife Service–designated critical habitat for several federally listed species. In addition, multiple special-status species and locally unique species have been found near or on the SVRA property. Part of the mission of State Parks is to conserve and

protect natural resources. Known habitat and special-status species locations were considered in the development of the Carnegie SVRA General Plan. The planning team also consulted with the resource agencies during preparation of the General Plan and the SVRA's environmental scientists regularly consult with the regulatory agencies for ongoing and planned projects. Preparation of the General Plan also included an extensive review of relevant databases and planning and policy documents. In addition, the General Plan includes many goals and guidelines addressing how these natural resources will be managed into the future.

CULTURAL RESOURCE MANAGEMENT

The planning area contains a substantial number of cultural resources, including historic-era and prehistoric sites. State Parks has conducted a complete cultural resource inventory of the existing SVRA and expansion area, and the significance of a large majority of the known resources has been evaluated by the State Historic Preservation Office. This information was used to guide the planning effort. Not only will State Parks continue to manage the resources as required by law, it also has conducted a constraints analysis before development of the General Plan to ensure that uses and facilities are situated to avoid adversely affecting significant resources. In addition, the General Plan contains numerous goals and guidelines aimed at the management and protection of cultural resources.

INTERPRETATION AND EDUCATION

Carnegie SVRA is located in an area rich with biological and cultural resources. This provides a great opportunity to educate visitors about the unique resources in and around the SVRA. Many people have expressed an interest in the various cultural and natural resources at the SVRA. Some people have even said that their ancestors lived in, worked in, or traveled through the Carnegie SVRA area. While the SVRA employs a full-time interpreter, interpretation is still somewhat limited today given the lack of additional staff, the lack of a volunteer program for interpretive services, and the lack of on-site interpretive facilities such as at the concession. There also is no cooperating association for the SVRA to support interpretive services. No interpretation master plan, which would guide the direction and implementation of educational programs at Carnegie SVRA, has been developed to date. . In addition, opportunities exist to use interpretation and education activities to promote responsible OHV recreation. The General Plan calls for the development of an interpretation master plan and contains numerous goals and guidelines to further develop interpretation and educational services at Carnegie SVRA and through online resources.

MINE SAFETY

The Tesla Coal Mine Site produced coal, sand, and clay between 1856 and 1911, and again briefly in the 1960s. The public and stakeholders have shown interest in visiting the area, but the mineshafts and tunnels present a potential safety hazard. The General Plan treats the Tesla Coal Mine Site with a special land use overlay that guides the uses appropriate to the area. Goals and guidelines aimed at visitor safety in general, and safety related to the Tesla Coal Mine Site in particular, are included in the General Plan.

CHAPTER 4 – THE PLAN

This General Plan establishes the long-range purpose and vision for Carnegie State Vehicular Recreation Area (SVRA). Specific visitor experience areas described in this plan clarify the management intent for and desired visitor experiences in these areas. The goals and guidelines in this General Plan provide guidance on how to achieve the purpose, vision, and management intent for the SVRA. The goals and guidelines were developed to address known planning issues while providing a foundation for resource protection, development, operation and management, and interpretation of the SVRA. The goals and guidelines also provide a framework for subsequent planning and development for the concepts included in this General Plan.

Known constraints in the planning area were evaluated before development of the visitor experience areas. Specifically, a cultural resource inventory and maps, biological resource mapping and monitoring information, slopes and soils information, and mine safety were taken into consideration and sensitive resources were avoided. Given the constraints avoidance, uses would be developed consistent with the visitor experience areas within an overall small portion of total 4,675-acre planning area.

The term "facilities" is used in this General Plan to refer to anything that is part of the built environment. This term includes all facilities envisioned in the General Plan, including trails and concentrated riding areas, campgrounds, picnic areas, gathering areas, an entrance kiosk, a ranger station, a training site that could include classroom/meeting space, an interpretative facility/visitor center, concessions, staging and parking areas, restrooms, drainage facilities, signage, fencing, solar or other renewable energy facilities, and access roads.

4.1 PURPOSE AND VISION

4.1.1 DECLARATION OF PURPOSE

The Declaration of Purpose describes the purpose of Carnegie SVRA and is the broadest statement of management goals designed to fulfill the vision of the SVRA. A Declaration of Purpose is required by California Public Resources Code (PRC) Section 5002.2(b). The previous Declaration of Purpose for Carnegie SVRA, adopted in December 1981, was updated during this General Plan process:

> The purpose of Carnegie SVRA is to provide effectively managed, responsible off-highway vehicle (OHV) and related recreational opportunities while protecting and interpreting the SVRA's valued cultural and natural resources.

4.1.2 SVRA VISION

The vision for Carnegie SVRA describes the SVRA in future years, when State Parks' Off-Highway Motor Vehicle Recreation (OHMVR) Division has achieved its General Plan objectives. The following vision was developed for Carnegie SVRA during the General Plan process:

Carnegie SVRA will be a regional destination where children and adults of all skill levels can ride, play, and learn in an outdoor recreational setting. Carnegie SVRA will continue to be an affordable location where visitors can enjoy a wide variety of OHV recreation. Carnegie SVRA will be a model of exciting and well-managed OHV recreation as well as excellent environmental stewardship. Visitors will be able to learn about and contribute to the long-term sustainability of diverse cultural and natural resources present within the SVRA.

4.2 UNIT CLASSIFICATION

Carnegie SVRA was added to the State Park system as an SVRA in July 1980. The site, which had been used by OHVs since the 1940s, was operated as a private motorcycle park from 1970 until 1979, before State Parks purchased it using OHV Trust Funds. Legislative action (PRC Section 5006.48) authorized State Parks to plan, acquire, and develop the site for OHV use. From 1996 to 1998, State Parks used OHV Trust Funds to acquire an additional 3,100 acres of adjacent property to provide additional OHV recreation opportunities. The additional acreage is referred to in this General Plan as "the expansion area." It was classified as SVRA lands and added to Carnegie SVRA at the time of purchase.

4.3 LAND USE MANAGEMENT

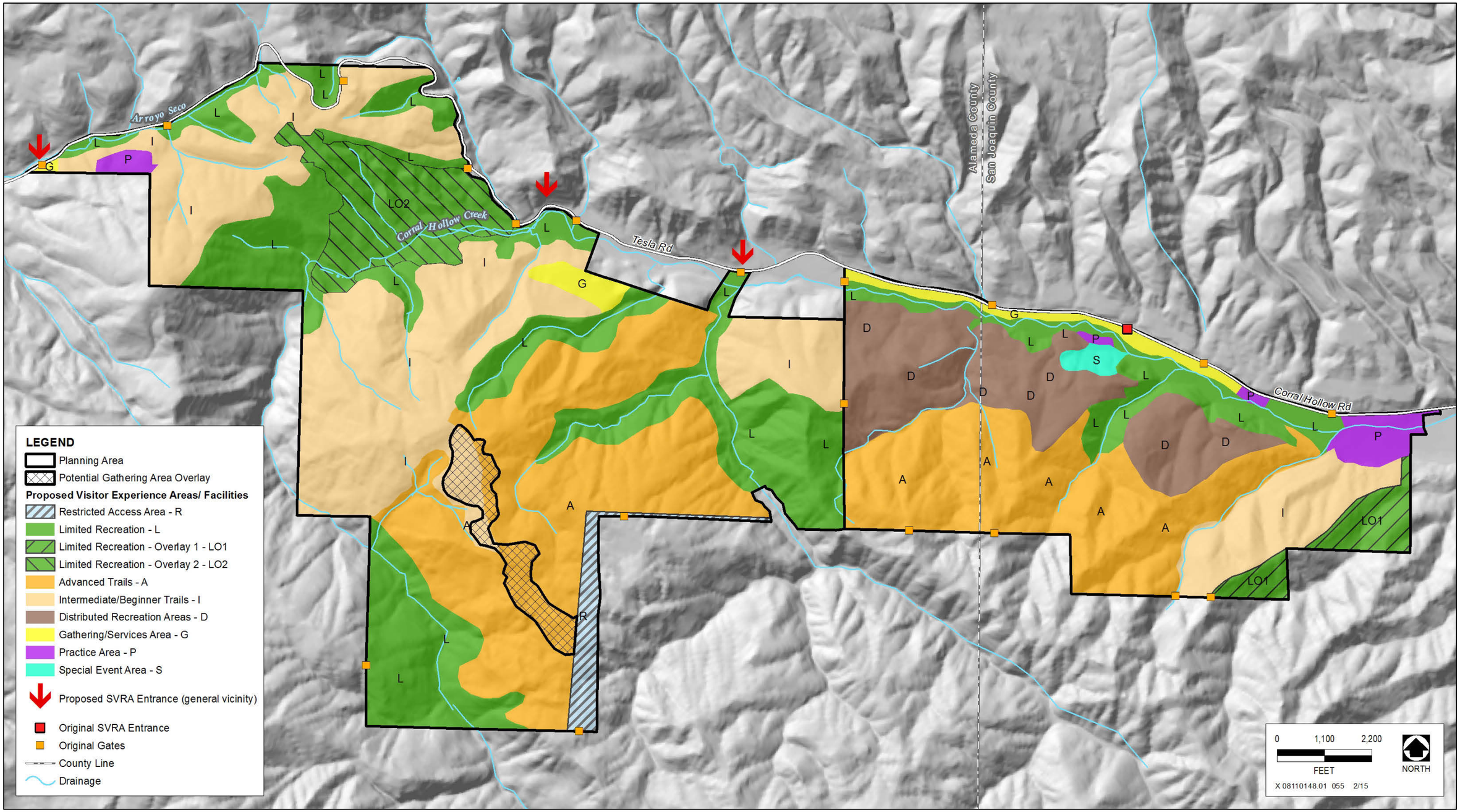
4.3.1 PROPOSED LAND USE AND FACILITIES

CIRCULATION AND ACCESS

The SVRA is proposed to have multiple entrances, with up to four entrances used daily. Figure 4-1 shows the locations of the existing and potential new daily public entrances. The exact locations of these entrances may change slightly from those currently shown, depending on subsequent project-level analysis of site-specific resources and existing conditions.

TESLA COAL MINE SITE

The Tesla Coal Mine Site requires special considerations during planning because of its inherent safety concerns and historical nature. A gathering area and interpretive facility is envisioned for the Tesla Coal Mine Site so visitors can learn about the important history of the area (see Limited Recreation Overlay 2—Tesla Mining Complex in Figure 4-1 and Table 4-1). For safety reasons, access to the actual mine site would be limited to guided tours. An interpretive center could be developed at the gathering area in the future. The interpretive facility would include information on the history of the California Native Americans who inhabited the region. The exact boundary of the gathering area may be refined in the future based on site-specific studies and project-level planning.



Source: Data compiled by AECOM in 2014

Figure 4-1. Preferred Concept Map

RECREATION

Providing additional recreation activities was one of the main purposes of acquiring additional property for the SVRA. The following is a list of important recreational goals for the SVRA, as defined through the planning process.

- Provide more recreational opportunities for beginner to intermediate OHV recreationists in the expansion area in addition to the intermediate to advanced opportunities already provided in the original SVRA.
- Provide multi-use OHV routes for all-terrain vehicles (ATVs), recreational OHVs (ROVs), four-wheel-drive (4WD) vehicles, and off-highway motorcycles in the expansion area. Provide continued access for off-highway motorcycles in the original SVRA, and preserve other recreational facilities in the original SVRA.
- Develop a 4WD technical course and trail/road system at the far western edge of the expansion area.
- Provide trails for skills development and technical riding throughout the SVRA. Adaptively modify these trails over time to improve and provide new visitor experiences, consistent with resource management goals and guidelines in the General Plan.
- Develop new gathering areas, parking, and OHV training sites in the western part of the expansion area.
- Place additional picnic areas at various sites throughout the SVRA and in all types of visitor experience areas.
- Accommodate motorized off-highway access to nonmotorized recreation opportunities such as walking around or visiting viewpoints.
- Provide additional camping areas in the expansion area.
- Develop a training site for OHV recreation at the current location of the Carnegie Sector office. The training site could include office space, parking, camping, classroom/meeting space, a restroom, technical skills obstacles, and trails. This site could fulfill the need for a youth area and could be combined with an interpretive center. A maintenance facility may also be included.

OPERATIONS

Managing the entire SVRA for visitor access and use will result in additional demands on operations. To accommodate these additional demands, the following operational improvements are envisioned in this General Plan:

- Staff will continue to use and maintain the existing maintenance yard. Additional maintenance space may be provided in the expansion area, if needed, to support operations of the entire SVRA.
- A ranger station will be accommodated at or near the entrance near the sector office.
- An interpretive facility will be accommodated in the area deemed most appropriate by future study.
- Facilities for communication or technology support could be located in any of the use areas, except for limited recreation areas. Some space within or near the special-event area will be designated as a helicopter landing site.
- With the expansion and full buildout of anticipated improvements, the OHMVR Division anticipates needing an additional seven full-time employees and seven to eight seasonal employees.

4.3.2 VISITOR EXPERIENCE AREAS

Carnegie SVRA includes 11 visitor experience areas, each with different characteristics, activities or allowable uses, and resources and related management mandates. State Parks will manage natural and cultural resources in the visitor experience areas to protect the resources' integrity and to comply with relevant state and federal laws and regulations regarding their management and protection. The resource management goals and guidelines described in Section 4.4 apply to all visitor experience areas.

Table 4-1 describes the visitor experience areas. The descriptions include the definition, allowable uses, and area-specific resource management prescriptions or considerations, if applicable. Resource management considerations are included only when there is an action or requirement for a specific visitor experience area beyond the general resource management goals and guidelines that apply in the entire SVRA.

Table 4-1. Visitor Experience Areas

Color on Map	Name	Description
	Limited Recreation Area	**Definition:** An area with a higher-than-average concentration of sensitive natural and/or cultural resources. **Allowable Uses:** Roads or trails may cross these areas to facilitate public egress/ingress and connectivity between other visitor experience areas; however, their footprint should be limited to the minimum necessary to serve their intended purpose, and they should be designed and managed to avoid or minimize impacts on the surrounding resources. No other facilities will be allowed. These areas could be available for nonmotorized recreational opportunities. **Resource Management:** These areas were chosen based on the presence of sensitive resources. **Total Approximate Acres*:** 1,090
	Limited Recreation Overlay 1—Waterfall Canyon	**Definition:** An area that, because of water quality management restrictions, needs to be managed like a limited recreation area. **Allowable Uses:** Hiking may be allowed. This area could accommodate OHV facilities as long as certain guidelines are met. For instance, this area could be changed to an intermediate or advanced trail area in the future if there is an additional acquisition that would allow State Parks to provide adequate water quality management measures for the watershed consistent with the

Table 4-1. Visitor Experience Areas

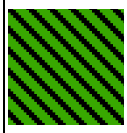
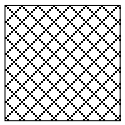
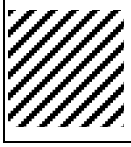
Color on Map	Name	Description
		Corral Hollow Watershed Assessment and the *Storm Water Management Plan for Carnegie SVRA*. **Resource Management**: This area is currently excluded from OHV recreation for water quality management purposes and will be managed according to the *Storm Water Management Plan for Carnegie SVRA* or the most current water quality management prescriptions. **Total Approximate Acres*:** 88 (not included in the Limited Recreation Area total)
	Limited Recreation Overlay 2—Tesla Mining Complex	**Definition:** An area that has a higher-than-average concentration of significant cultural resources and includes the Tesla Coal Mine Site, which poses some safety concerns. **Allowable Uses:** This area could accommodate facilities as long as certain guidelines are met. In the Tesla Mining Complex overlay area, a gathering area could be allowed and other limited facilities such as trail or road crossings may be allowed. The chosen sites would have to be evaluated and engineered for safety and monitored. If there were a potential impact on a cultural resource, the appropriate mitigation would have to be implemented to minimize or avoid significant impacts. **Total Approximate Acres*:** 240 (not included in the Limited Recreation Area total)
	Advanced Trails Area	**Definition:** An area that provides more challenging OHV trails. **Allowable Uses:** This area will allow OHV trails and challenge areas. Trails for skills development and technical riding will be allowed. These trails could be adaptively modified over time to improve the visitor experience and provide new experiences. Examples of trails and experiences that could be found in these areas include minor hillclimbs/descents; a terrain park or trials trail for off-highway motorcycles; rocky trail sections; tight turns; roll and flow; and skills practice trails for off-highway motorcycles, ATVs, and/or ROVs. Trails should be designed and constructed to be narrow and to limit soil erosion. 4WD touring could be accommodated in the expansion area. **Resource Management:** Challenge areas would be allowed where most appropriate using site-specific studies and would be closed and rotated as needed to restore soil and/or vegetation. **Total Approximate Acres*:** 1,360
	Intermediate/ Beginner Trails Area	**Definition:** An area that provides OHV trails of easy to moderate difficulty. **Allowable Uses:** This area will allow OHV trails and challenge areas. Trails for skills development and technical riding are allowed. These trails could be adaptively modified over time to improve visitors' experiences and provide new experiences. Examples of trails and experiences that could be found in these areas include minor hillclimbs/descents; a terrain park or trials trail for off-highway motorcycles; rocky trail sections; tight turns; roll and flow; and skills practice trails for off-highway motorcycles, ATVs, and/or ROVs. Trails should be designed and constructed to be wider than those in the advanced trails areas, and to have gradual turns and moderate trail slopes. 4WD touring could be accommodated in the expansion area. **Resource Management:** Challenge areas would be allowed where most appropriate using site-specific studies and would be closed and rotated as needed to restore soil and/or vegetation. **Total Approximate Acres*:** 1,201
	Gathering and Services Area	**Definition:** An area that provides places for visitors to gather and access services. **Allowable Uses:** Campgrounds, restrooms, picnic areas, parking areas, concessions, ranger station, entrance kiosk, staging, etc. **Resource Management:** Facilities and associated landscaping should be designed to assure safety and to provide an attractive natural setting, while limiting maintenance requirements. **Total Approximate Acres*:** 90

Table 4-1. Visitor Experience Areas

Color on Map	Name	Description
	Gathering Areas Overlay	**Definition:** An area that could be used for a gathering and services area if needed. **Allowable Uses:** Uses for this area would be the same as for the underlying visitor experience area, unless it is decided that some or all of this area would be needed for a gathering and service area. If the area is needed, then the allowable uses for gathering and services areas would prevail. **Resource Management:** This area was chosen to avoid known sensitive natural and/or cultural resources. Before planning and building facilities, site-specific studies would be conducted. **Total Approximate Acres*:** 91
	Distributed Recreation Area	**Definition:** An area in which OHV recreation is not limited to specific trails. **Allowable Uses:** Trails and experiences that could be found in these areas include hillclimbs/descents; tight turns, roll and flow; and skills practice trails for off-highway motorcycles and ATVs. There may be small concentrated riding areas within distributed riding areas to provide opportunities such as hillclimbing or high banking. **Resource Management:** Distributed recreation areas will be clearly delineated and posted to limit visitors from riding off trail in adjacent areas not designated for distributed riding. Soil and vegetation restoration may be needed to limit soil erosion and to conserve the area's natural character. Trails and concentrated riding areas within distributed riding areas may be changed over time to create new experiences and to restore vegetation and/or soils. Areas within the distributed recreation area may be closed to OHV use to conserve specific resources, to provide gathering areas for visitors, or to allow for management of a particular resource. A vegetative buffer will be maintained along corridors with properly sited and armored approaches and crossings to prevent erosion and protect water quality. **Total Approximate Acres*:** 430
	Practice Area	**Definition:** An area that provides specialized opportunities for visitors of different age groups and experience levels to develop riding/driving skills. **Allowable Uses:** Uses in these areas may include tracks, trails, challenge courses, technical challenge areas, or other facilities for all types of OHV vehicles that allow riders and drivers to practice and/or challenge themselves. Facilities need to be carefully designed, constructed, and managed to create safe and enjoyable experiences. **Total Approximate Acres*:** 73
	Special Event Area	**Definition:** An area that provides a space for competitive hillclimbing events. **Allowable Uses:** Hillclimbs, space for spectators, vendors, staging, and other related activities. The area needs to be secured during hillclimb events for the safety of competitors and other visitors. **Resource Management:** The special-event area will be opened and closed on a rotating basis for vegetation and/or soil restoration purposes. The area will be clearly delineated and posted to limit visitors from riding off trail in adjacent areas. **Total Approximate Acres*:** 19
	Restricted Access Area	**Definition:** An area that provides a buffer between public uses and a neighboring property. **Allowable Uses:** Management-related activities such as cattle grazing, maintenance, repair, and patrolling. **Total Approximate Acres*:** 67

Notes: 4WD = four-wheel-drive; ATV = all-terrain vehicle; OHV = off-highway vehicle; ROV = recreational off-highway vehicle; SVRA = State Vehicular Recreation Area

* Totals are approximate due to rounding and the planning area boundary used (which is approximate based on mapping available), and are greater than the approximately 4,675-acre planning area because the Gathering Areas Overlay overlaps with other visitor experience areas (see Figure 4-1).

Source: Data provided by State Parks and compiled by AECOM in 2014

4.4 GOALS AND GUIDELINES

The goals and guidelines in this section apply to all Carnegie SVRA visitor experience areas. Where specific resource management is warranted for a particular visitor experience area, the applicable management strategies are outlined in Table 4-1. The 1981 Carnegie SVRA General Plan's goals and guidelines formed the basis for the goals and guidelines of this current plan. Substantial additions and changes were made to reflect changed conditions, new areas of the SVRA, and specific topics warranting additional management, as refined by the planning process, current knowledge or resources present, and the current regulatory environment.

Management of the SVRA is undertaken in compliance with all applicable statutory and regulatory requirements, including the following:

- Section 404 of the federal Clean Water Act (CWA)
- Section 401 of the CWA
- Section 402 of the CWA
- Porter-Cologne Water Quality Control Act of 1969
- Title 24 of the California Building Standards Code
- Alquist-Priolo Earthquake Fault Zoning Act
- Federal Endangered Species Act
- California Endangered Species Act
- California Fish and Game Code
- California Public Resources Code
- California Vehicle Code

Detailed descriptions of these laws and regulations and their applicable sections are included in Section 2.7.3 of this General Plan.

4.4.1 PARKWIDE GOALS AND GUIDELINES

VISITOR EXPERIENCE AND OPPORTUNITIES (VEO)

VEO Goal 1: When planning for recreation opportunities and visitor services, provide a broad range of OHV recreation experiences and opportunities for visitors to enjoy and appreciate.

- **VEO Guideline 1.1:** Plan a variety of OHV activities that visitors will engage in, including off-highway motorcycles, trials bikes, ATVs, side-by-side utility vehicles, 4WD vehicles, and additional activities that may become popular in the future.

- **VEO Guideline 1.2:** Provide appropriate facilities for a range of age and skill levels from novice through expert OHV recreationists.

- **VEO Guideline 1.3:** Anticipate changes in the percentage of different types of OHV equipment as technologies, designs, and interests change over time.
- **VEO Guideline 1.4:** Anticipate changes in regional demographics and trends.
- **VEO Guideline 1.5:** Incorporate universal access standards.
- **VEO Guideline 1.6:** Allow nonvehicular uses such as hiking and picnicking in areas attractive for such use and where such activities would not be in conflict with OHV recreation or create unsafe circumstances for visitors.

VEO Goal 2: Provide state-of-the-art visitor-serving facilities to enhance the visitor experience.

- **VEO Guideline 2.1:** Develop additional recreation facilities to provide a more diverse visitor experience, to meet the recreation needs of the regional and local community, and to attract visitors from outside the region.
- **VEO Guideline 2.2:** Locate facilities to allow for effective and efficient visitor use and to provide opportunities for social interaction between user groups while minimizing potential user conflicts.
- **VEO Guideline 2.3:** When planning to develop new facilities, consider the need for maintenance and public safety personnel, equipment, communications, and emergency vehicle access.

VEO Goal 3: Enhance individual-, family-, and community-centered recreational opportunities.

- **VEO Guideline 3.1:** Provide recreational opportunities that respond to local needs and interests. These could include special events for children new to OHV recreation, events planned to celebrate important local historical events, and events that emphasize safety and responsible OHV recreation.
- **VEO Guideline 3.2:** Seek to provide additional group-oriented recreational opportunities, social gathering opportunities, and facilities that are compatible with OHV use.

PHYSICAL RESOURCE MANAGEMENT

WATER QUALITY (WATER)

Water Goal 1: Manage the SVRA for the protection of jurisdictional waters of the United States, including wetlands and waters of the state, while maintaining a quality OHV recreational experience.

- **Water Guideline 1.1:** Avoid locating facilities in areas delineated as jurisdictional waters of the United States, including wetlands; areas that qualify as waters of the state under the Porter-Cologne Water Quality Control Act of 1969, and areas subject to California Department of Fish and Wildlife (CDFW) regulation under California Fish and Game Code Section 1602. Where avoidance is not feasible, such as for trail crossings, design facilities to minimize impacts.

- **Water Guideline 1.2:** Work to attain no net loss of wetlands functions and values at the SVRA. If impacts on jurisdictional features cannot be fully avoided:

    - Determine the acreage of direct impacts (i.e., fill of wetlands) and indirect impacts (i.e., alterations to wetland hydrology) that would result from project implementation, and obtain necessary permits.

    - Provide compensatory mitigation such that the functions and values of all affected wetlands and other waters of the United States, waters of the state, and stream and riparian habitats protected under the California Fish and Game Code are replaced, restored, or enhanced on a "no net loss" basis. Restore, enhance, and/or replace wetland, water, and riparian habitat acreage at a location and by methods agreeable to the U.S. Army Corps of Engineers (USACE), the Central Valley Regional Water Quality Control Board (RWQCB), CDFW, and/or the U.S. Fish and Wildlife Service (USFWS) as appropriate and depending on agency jurisdiction.

Water Goal 2: Manage the SVRA for the protection of water quality while maintaining a quality OHV recreational experience.

- **Water Guideline 2.1:** Avoid siting facilities in and immediately adjacent to riparian or stream corridors or within waters of the United States or the state, including seeps, ponds, or drainages. Stream corridors shall be managed with vegetated buffers and crossings shall be properly sited for circulation and designed to minimize erosion and other water quality impacts. Design measures include but are not limited to:

    - armoring approaches,
    - providing sediment traps or filter areas,
    - hardening the crossing surface,
    - protecting the streambanks from vehicle backwash and overflow during flooding, and
    - modifying super elevation (direction of tilt) such that roads and trails drain away from stream corridors.

    Culverts or bridge crossings shall be considered in highly erosive areas.

- **Water Guideline 2.2:** Implement best management practices (BMPs) in operating the SVRA, consistent with the *Storm Water Management Plan for Carnegie SVRA* (SWMP) or applicable subsequent document. Monitor water quality regularly and implement adaptive management practices as warranted. Adaptive management practices used may include permanent or seasonal area closures, facility redesign, and hillside restoration.

- **Water Guideline 2.3:** Implement the requirements of the SWMP or subsequent amendments or replacement documents. These requirements include use of sediment basins, revegetation and erosion control blankets, dust suppressants, gully rehabilitation, and monitoring for water quality as prescribed in the plan and may include additional measures in the future.

- **Water Guideline 2.4:** Before, during, and after the construction of facilities proposed and envisioned in this General Plan, implement all water quality control measures required under the National Pollutant Discharge Elimination System Construction General Permit. Develop a storm water pollution prevention plan, including the identification of BMPs that must be implemented to reduce water quality degradation of receiving waters during and after construction activities. Incorporate construction BMPs from the *OHV BMP Manual for Erosion and Sediment Control* (OHV BMP Manual) or subsequent applicable document, as appropriate.

- **Water Guideline 2.5:** When developing detailed plans for facilities proposed and envisioned in this General Plan, incorporate permanent water quality control features, as appropriate, with guidance from the SWMP and any subsequent amendments or replacement documents. Incorporate information from the OHV BMP Manual and the OHMVR *Soil Conservation Standard and Guidelines* (or subsequent amendments) as appropriate to designs. Select water quality control features appropriate to site conditions at Carnegie SVRA and consistent with state-of-the art science on water quality management.

- **Water Guideline 2.6:** To reduce erosion and sedimentation, improve areas that have experienced substantial erosion from surface water runoff as determined by annual inspections. Implement rehabilitation concepts for these features as described in the SWMP or subsequent or replacement documents.

- **Water Guideline 2.7:** Close an area to OHV use if it has been determined that the area cannot feasibly be rehabilitated or reclaimed in accordance with OHMVR Division water quality management standards.

- **Water Guideline 2.8:** To minimize erosion problems, landslide hazards, and costly maintenance, consider invoking the temporary closure of portions or all of the SVRA based upon conditions established by the rain closure policy. That policy will be reviewed and updated as necessary.

- **Water Guideline 2.9:** Prohibit recreational use of special vehicles and accessories, such as "widowmaker" tires, chained tires, or tracked vehicles, in the SVRA unless special permission is given by the District Superintendent. The District Superintendent has the authority to prohibit use of any vehicle or accessory that is inappropriate in the SVRA.

Water Goal 3: Manage the SVRA to conserve water resources while maintaining a quality OHV recreational experience.

- **Water Guideline 3.1:** When developing detailed plans for facilities envisioned in this General Plan, assess available water sources that will yield sufficient water supplies needed for operation and maintenance of the facilities. Develop water supply as appropriate in compliance with state regulatory requirements.

- **Water Guideline 3.2:** Use recycled water, as available, for dust control and irrigation as allowed by water quality and health regulations and as available at the site or nearby.

- **Water Guideline 3.3:** Manage facilities to accommodate periods of drought or low water supply. Restrict the use of water for dust control, and use alternative dust suppression methods as necessary.

- **Water Guideline 3.4:** Implement water conservation measures that will reduce water use by 10 percent by 2015 and 20 percent by 2020 as measured against a 2010 baseline in accordance with Executive Order B-18-12 issued by Governor Edmund G. Brown Jr. on April 25, 2012, and with the Proclamation of a State of Emergency signed on January 17, 2014, and the Proclamation of Continued State of Emergency signed on April 25, 2014.

Water Goal 4: Anticipate issues related to flood control when planning for the development of the SVRA.

- **Water Guideline 4.1:** When developing detailed plans for facilities envisioned in this General Plan, consider flood hazard areas in the Corral Hollow Creek floodplain. Design facilities to be located outside of the flood hazard areas wherever possible. If facilities cannot be located outside of potential flood hazard areas, they should be designed to withstand occasional flooding; minimize effects on facilities from seasonal flooding; and protect visitors from flood hazards through design, and through applications of adaptive management such as seasonal closures of areas at risk of flooding. If structures must be located within potential flood areas, they should be designed such that the structure does not substantially impede or redirect flood flows.

  If buildings (i.e., a ranger station, training facilities, or a visitor/interpretative center) are planned for development in the 100-year floodplain, State Parks should do the following:

  - Prepare an analysis using a standard hydraulic model, such as USACE's Hydraulic Engineering Center River Analysis System. Model existing and projected water surface elevations, flow rates, and flow widths for the 2-year, 10-year and 100-year (0.01 annual exceedance probability) storm events. The modeling results will demonstrate that flood flows will be appropriately channeled and contained, so that the risk to people or damage to structures within or downgradient from the proposed development in the Carnegie SVRA stream reach will not occur. The modeling results also will demonstrate that hydromodification will not be increased from predevelopment levels, indicating that existing stream geomorphology will not be altered.

  - Prepare and submit a Conditional Letter of Map Revision to the Federal Emergency Management Agency (FEMA), showing the existing 100-year (0.01 annual exceedance probability) floodplain for the site, and obtain an approved Conditional Letter of Map Revision from FEMA for the proposed developed condition.

  Campgrounds, picnic areas, restrooms, and parking areas will not be included in these requirements.

SOILS

Soils Goal 1: Manage the SVRA for a balance of uses that allow protection and conservation of soil while maintaining a quality OHV recreational experience.

- **Soils Guideline 1.1:** Manage Carnegie SVRA facilities to meet the current OHMVR Division *Soil Conservation Standard and Guidelines* or subsequent amendments or replacement documents.

- **Soils Guideline 1.2:** Develop an adaptive management plan for soil resources consistent with PRC Section 5090.35(a) and the OHMVR Division *Soil Conservation Standard and Guidelines* or subsequent amendments or replacement documents. Incorporate the tools and techniques identified as appropriate to site conditions at Carnegie SVRA. Also incorporate other tools and techniques that may apply to specific facility conditions and management structure at the SVRA.

- **Soils Guideline 1.3:** Incorporate the guidance provided in the OHV BMP Manual or subsequent or replacement document when planning for the development of new facilities. Select, implement, and maintain BMPs, including those designed for stockpiles, during and after construction activities to avoid soil loss and the potential for resulting air pollution or degradation of water quality.

- **Soils Guideline 1.4:** Use slope to help manage soils. A full range of park facilities may be considered on areas with less than 20 percent slopes. Trails may be constructed (with BMPs) in areas with slopes between 20 percent and 45 percent, but buildings should not be constructed in these areas. On areas with slopes in excess of 45 percent, trails and park facilities should be limited and serve only the most advanced riders. Appropriate BMPs should be implemented in each area to manage erosion potential.

- **Soils Guideline 1.5:** Restrict hillclimbing activities to the hills adjacent to Corral Hollow Creek. In this area, soils mapped as Altamont clay (0–65 percent slope) and Saurin loam and clay loam (0–65 percent slope) are preferred for intensive hillclimbing.

GEOLOGY (GEO) AND PALEONTOLOGICAL RESOURCES

Geo Goal 1: Manage the SVRA to minimize geologic hazards while maintaining a quality OHV recreational experience.

- **Geo Guideline 1.1:** To prevent hazards associated with potentially unstable soils and ensure public safety, before allowing access to the expansion area, prohibit visitor access to abandoned mines through the use of signage and installation of gates or other barriers that physically block the mine opening.

- **Geo Guideline 1.2**: To minimize seismic hazards from liquefaction, avoid placing buildings or other structures intended for human occupancy within 300 feet of Corral Hollow Creek unless a site-specific liquefaction analysis prepared by a geotechnical engineer determines otherwise.

- **Geo Guideline 1.3**: All new restrooms shall use wastewater containment systems (i.e., wastewater holding tanks such as those used in portable toilets or concrete vault toilets), with periodic removal, treatment, and disposal off-site by a licensed contractor. If construction of septic leachfields cannot be avoided, an engineered septic system should be designed by a licensed civil or geotechnical engineer and constructed according to the engineer's specifications.

Geo Goal 2: Promote staff education and visitor awareness of paleontological resources and proper procedures to be followed if fossils are discovered.

- **Geo Guideline 2.1**: Provide annual paleontological resource training to SVRA staff members. Inform State Parks peace officers (SPPOs) about the areas most likely to contain the unique paleontological resources that would be most susceptible to looting, vandalism, or damage by SVRA visitors, so that the SPPOs can watch for site impacts and vandalism. Also educate the SPPOs on current laws related to paleontological resources. SVRA field staff such as maintenance and trails team members shall be educated on what to do if paleontological resources are inadvertently discovered during a project. All SVRA staff members shall be educated on what to do if they or SVRA visitors find a paleontological object.

- **Geo Guideline 2.2:** If paleontological resources are discovered inadvertently during construction activities, cease construction activities within and in the vicinity of the fossil and consult an OHMVR Division archaeologist or other qualified paleontological resource professional to determine the potential significance of the find. If the fossil is determined to be a unique paleontological resource, develop and implement a recovery plan consistent with Society of Vertebrate Paleontology (SVP 1996) criteria. The recovery plan may include but is not limited to a field survey, construction monitoring, sampling and data recovery procedures, curation for any specimen recovered, and a report of findings.

- **Geo Guideline 2.3:** If fossils become exposed during operation of the SVRA, require that they be collected by paleontologists or properly trained unit staff members, as designated by the State Parks geologist and area manager. Keep careful records of all paleontological finds. Fossils should be properly identified by qualified persons. Specimens may be stored or displayed in the unit (in adequate facilities), or at a designated repository, in accordance with State Parks' artifact management policies.

NATURAL RESOURCES

NATURAL RESOURCE MANAGEMENT (NRM)

NRM Goal 1: Manage Carnegie SVRA for a balance of uses that allow protection and stewardship of natural resources while maintaining a quality OHV recreational experience.

- **NRM Guideline 1.1:** Locate visitor-serving facilities in prior disturbed areas or in areas of relatively low resource value to minimize disturbance to higher value habitat areas.

- **NRM Guideline 1.2:** Before planning new visitor-serving or operations facilities, or expanding existing ones, conduct site-specific surveys/mapping of sensitive biological resources (such as special-status species and sensitive habitats) and take the location and extent of these resources into consideration during the planning and design process. Avoid affecting sensitive biological resources during planning, design, and construction. Utilize fencing and other methods to exclude public access in environmentally sensitive areas, as necessary. Conduct worker environmental awareness training for construction personnel before construction.

- **NRM Guideline 1.3:** In the event that disturbing a sensitive biological resource is unavoidable, minimize the disturbance to the minimum area necessary to achieve the project purpose, and identify and implement measures to offset those impacts in consultation with a qualified biologist and the appropriate resource agencies (e.g., CDFW, USFWS, USACE, and the Central Valley RWQCB), depending on the listing or protection status of the resource.

- **NRM Guideline 1.4:** Continue to implement the OHMVR Division's Habitat Monitoring System (HMS) consistent with State Parks' resource management directives, and with the specific biological provisions that outline management programs for working with natural processes of vegetation succession, controlling the spread of noxious and invasive weeds, and protecting natural wildlife habitat. Use the HMS as a tool to aid in the implementation of park-specific monitoring and adaptive management, with a focus on trends in percent habitat cover, focal species distribution and abundances, and comparisons between riding and nonriding areas. When completed, incorporate use of the HMS data management system to accumulate, standardize, and analyze records of plants, animals, and habitats in the planning area and guide adaptive management.

- **NRM Guideline 1.5:** Focus new trail development in areas of relatively low habitat value. Route new trails around the edges of high-quality habitat and include buffers to avoid habitat fragmentation. Maintain strict enforcement of riding destination requirements throughout the SVRA, according to the allowable uses in the respective visitor experience areas, and monitor for compliance. If noncompliance is documented, enact adaptive management techniques such as temporary closures or other measures proven effective at the SVRA.

NRM Goal 2: Encourage a balance of uses that allow for the restoration or enhancement of natural habitats while maintaining a quality OHV recreational experience.

- **NRM Guideline 2.1:** Implement an adaptive management plan for biological resources that combines the results of monitoring implemented through the HMS (NRM Guideline 1.4) and monitoring for soil conservation (Soils Guideline 1.2). Identify and establish adaptive management opportunity zones in areas of high-quality natural habitat and sensitive habitat, or where populations of special-status wildlife and plants occur or could occur (e.g., elderberry shrub or California tiger salamander breeding ponds). Implement management actions to protect these zones from activities that could disturb sensitive resources or to enhance/restore them as part of the adaptive management process.

- **NRM Guideline 2.2:** Implement adaptive management, including temporary or rotating closures, invasive species management, and habitat enhancement, to allow natural regenerative processes to occur; enact these measures proactively. Use signage to inform visitors of areas that contain sensitive biological resources or are closed. Use interpretive materials to inform visitors of habitat enhancement and restoration activities to promote environmental stewardship.

- **NRM Guideline 2.3:** Manage SVRA landscapes to preserve natural vegetation and to enhance native California plant communities and associated habitat functions and values. Management strategies include habitat restoration and enhancement; invasive species management; focused propagation of desired species; fencing or other barriers to protect sensitive habitats such as riparian areas, to maximize natural recruitment of riparian species; controlled burns; managed grazing; or other management techniques proven beneficial to the maintenance of healthy natural ecosystems.

- **NRM Guideline 2.4:** Apply state-of-the-art science and ecological knowledge to the management of natural communities and associated habitat functions at the SVRA. Management strategies shall take current science and results from ongoing management and research into consideration. Work with the academic community to continue to allow research at the SVRA and apply knowledge gained through on-site and off-site research to site-specific resource management. OHMVR Division environmental scientists shall conduct research and coordinate studies with research at other SVRAs, as appropriate.

PLANTS

Plant Goal 1: Manage the SVRA for a balance of uses that allow protection of special-status plants and sensitive natural communities while maintaining a quality OHV recreational experience.

- **Plant Guideline 1.1:** Conduct protocol-level surveys for special-status plants on the sites of proposed facilities during the planning and design process. Conduct the surveys during the blooming season for all potentially occurring special-status plant species according to the most current methodology recommended by CDFW and USFWS, depending on the listing status of the species. The surveys shall be conducted by a qualified botanist familiar with the flora of Alameda and San Joaquin Counties. Document the survey results in a written report submitted to the OHMVR Division. Map the location and extent of all occurrences of special-status plant species encountered during the surveys and maintain the data in the SVRA's Geographic Information System database. If construction of facilities is delayed, repeat special-status plant surveys every 5 years to ensure that data are current and account for long-term and seasonal variation.

- **Plant Guideline 1.2:** Prohibit impacts on existing occurrences of special-status plants during project implementation.

- **Plant Guideline 1.3:** Avoid siting facilities within 100 feet of known special-status plant occurrences to avoid indirect impacts. If these buffers cannot be maintained, use design features to protect the occurrences from indirect impacts.

- **Plant Guideline 1.4:** Use drought-tolerant plants, and whenever feasible, use plants native to the site for landscaping. Select plants that require little or no irrigation. If irrigation is required for plant establishment, use temporary irrigation methods that allow a gradual tapering off of watering over a 3- to 5-year period. Regulate water pressure at a level that applies sufficient water without causing erosion, damage to plants, or runoff.

- **Plant Guideline 1.5:** Monitor for existing and/or incipient populations of invasive weeds annually. If new invasive weeds are documented, implement actions to prevent their establishment and spread before they become established or occupy large portions of the SVRA. Maintain weed management practices for the SVRA consistent with OHMVR Division policies or other applicable guidance and based on best available science.

- **Plant Guideline 1.6:** Limit removal of native trees. Any trees removed as a result of facilities construction shall be replaced, with the specific number of trees to be replaced determined during project-level planning. At both new and existing facilities, prohibit adverse indirect effects on native trees from root compaction and physical damage. Preserve or enhance the extent of native woodlands at the SVRA and look for opportunities for enhancement and restoration.

Wildlife

Wildlife Goal 1: Manage the SVRA to maintain a quality OHV recreational experience while protecting native wildlife species, including special-status wildlife species and their designated habitats.

- **Wildlife Guideline 1.1:** Conduct annual (or more frequent) monitoring as part of the HMS, to look for signs of active use by burrowing owls. If signs are detected during monitoring, consider active management strategies to encourage and preserve use of the site by this species. Such strategies include placing new facilities away from any active burrowing owl; appropriate buffers shall be sized depending on the use of the burrow (nesting or wintering) and the disturbance impact, as described in *Staff Report on Burrowing Owl Mitigation* (DFG 2012) or subsequent version and/or consultation with CDFW.

- **Wildlife Guideline 1.2:** Avoid siting new facilities within 150 feet of pools currently known or later identified to support California red-legged frog, California tiger salamander, western pond turtle, or western spadefoot.

- **Wildlife Guideline 1.3:** Avoid siting facilities within 100 feet of elderberry shrub locations. If work or placement of facilities closer to existing shrubs is required, implement appropriate measures,

developed in consultation with USFWS, to avoid or compensate for direct and indirect impacts on valley elderberry longhorn beetle.

- **Wildlife Guideline 1.4:** Avoid siting facilities within 150 feet of preferred Alameda whipsnake habitat, particularly scrub vegetation types. If placement of facilities within or adjacent to Alameda whipsnake habitat cannot be avoided, implement appropriate measures to avoid or compensate for direct and indirect impacts on Alameda whipsnake resulting from project-specific activities. Implement protection measures agreed upon during consultation with USFWS. Encourage further research into the presence of Alameda whipsnake at the site, to ensure that management is based on the best available knowledge of the species and its requirements.

- **Wildlife Guideline 1.5:** During placement of new facilities, avoid known breeding locations of all special-status avian species known to occur in the planning area.

- **Wildlife Guideline 1.6:** If construction activities are planned during the breeding season of common and special-status birds, conduct a preconstruction survey of the construction zone and establish an appropriate buffer (as determined by a qualified biologist) within 2 weeks of construction onset. If breeding birds are documented, establish appropriate buffer zones around the occupied nests to protect the birds until the young have fledged.

- **Wildlife Guideline 1.7:** If construction activities are planned within suitable upland habitat for special-status amphibians (California red-legged frog, California tiger salamander, or western spadefoot) and within the known maximum upland dispersal distance of those species from known breeding habitat, develop and implement appropriate measures to avoid or compensate for potential direct and indirect impacts of project-specific activities on special-status amphibians in upland habitats. Before the start of construction, implement any protection or mitigation measures agreed upon during consultation with the wildlife agencies.

- **Wildlife Guideline 1.8:** Perform a preconstruction survey for potential bat roosting habitat (large trees with cavities, rock outcrops, caves, mines) in proposed construction areas and a 100-foot buffer around the construction area (Western Bat Working Group 2007). Implement avoidance and minimization measures determined appropriate by a qualified biologist based on guidance from the wildlife agencies and the best available science before conducting any activity within 100 feet of known bat roost locations.

- **Wildlife Guideline 1.9:** Perform preconstruction surveys for active burrowing owl burrows for proposed construction that would occur within suitable burrowing owl habitat or within 50 feet of suitable burrowing owl habitat. Conduct preconstruction surveys according to current CDFW guidelines as described in their *Staff Report on Burrowing Owl Mitigation* (DFG 2012) or subsequent version. Because burrowing owls can be present throughout the year, this guideline would be implemented in suitable burrowing owl habitat regardless of the time period for initiation of construction. If active burrowing owl burrows are found, CDFW would be consulted regarding

appropriate avoidance and minimization measures, including no disturbance buffers, to be implemented during construction and any additional mitigation measures agreed upon during consultation with CDFW.

CULTURAL RESOURCE MANAGEMENT (CR)

CR Goal 1: Identify, document, and evaluate cultural resources within Carnegie SVRA.

- **CR Guideline 1.1:** Although a complete cultural resource study/inventory of Carnegie SVRA was completed for this General Plan, develop an ongoing program to maintain and update the existing cultural resource inventory; site recordation and evaluation; global positioning system (GPS) recordation; historical, archaeological, and ethnographic research; and preparation of new and updated site records and archaeological survey reports for the cultural resources within Carnegie SVRA.

- **CR Guideline 1.2:** Nominate those cultural resources determined eligible by the State Historic Preservation Officer for listing in the National Register of Historic Places (NRHP). Determine resource eligibility of those cultural resources that have yet to be evaluated for listing in the NRHP or in the California Register of Historical Resources (CRHR) and nominate those cultural resources determined eligible.

- **CR Guideline 1.3:** Incorporate information from ongoing local California Native American consultation, ethnographic research, and involvement in the program of identifying, documenting, and evaluating cultural resources at Carnegie SVRA into cultural resource management. The information gained from ongoing local California Native American consultation and involvement will contribute to the existing ethnographic and archaeological data and could help in locating, identifying, and evaluating additional California Native American cultural resources within Carnegie SVRA.

CR Goal 2: Protect, stabilize, and preserve cultural resources.

- **CR Guideline 2.1:** Incorporate all known cultural resources either listed or eligible for listing in the NRHP or the CRHR, and all Native American cultural resources identified by local tribes and individuals as sacred or culturally significant, into an ongoing archaeological condition monitoring/ assessment program that examines and documents the effects of visitor use and natural erosion. Examinations shall be conducted by a qualified state archaeologist and shall document current site conditions using Archaeological Site Condition Assessment Records, photographs, and GPS equipment. Mitigation measures shall be developed where considerable damage to sites is identified. Such mitigation measures can include site-specific closures, revegetation, sign placement, fencing, site burial, education, and other applicable methods.

- **CR Guideline 2.2:** Protect, stabilize, and preserve in place all known cultural resources either listed or eligible for listing in the NRHP or CRHR, and all Native American ethnographic resources

identified by local tribes and individuals as sacred or culturally significant, in accordance with PRC Sections 5024 and 5024.5 and Governor's Executive Order B-10-11 ("Native American Consultation Policy").

- **CR Guideline 2.3:** Develop and incorporate cultural resource management and protection measures, including procedures for site damage assessment, in wildfire plans and additional natural-disaster plans and procedures. Identify the cultural resources most vulnerable to impacts because of natural disaster, especially those either listed or determined eligible for listing in the NRHP or the CRHR, for implementation of such protection measures.

- **CR Guideline 2.4:** Design all SVRA undertakings, including routine maintenance and new facility development, to avoid or minimize significant impacts on all known cultural resources either listed or eligible for listing in the NRHP or CRHR, and all Native American ethnographic resources identified by local tribes and individuals as sacred or culturally significant. Knowledge of the location of these sites was taken into consideration when selecting the preferred concept and shall be taken into consideration during future site specific planning in all visitor experience areas.

- **CR Guideline 2.5:** Actively consult with local tribes and individuals (Muwekma Ohlone, Mutsun Ohlone, Northern Valley Yokuts, and Miwok) regarding the protection, preservation, and/or mitigation of culturally significant resources within Carnegie SVRA in compliance with Governor's Executive Order B-10-11; the Natural Resources Agency's Tribal Consultation Policy; and State Parks' Departmental Notice 2007, *Native American Consultation Policy and Implementation Procedures*. Attempt to meet with California Native American tribes and individuals at least twice a year as part of Carnegie SVRA's ongoing California Native American consultation efforts. Departmental Notice 2007, *Native American Consultation Policy and Implementation Procedures*, identifies the following nine areas of project activity where consultation between local California Native American tribes and individuals and State Parks is required:

    - Acquisition of properties where cultural sites are present
    - General Plan process and/or development of management plans
    - Planning, design, and implementation of capital outlay and other public works and development projects
    - Issues of concern identified by the tribes
    - Plant and mineral gathering by Native Americans
    - Access to California Native American ceremonial sites
    - Archaeological permitting

- Mitigation of vandalism and development of protective measures at Native American sites
- Use of the Native voice in presenting the story of California Native Americans in park units

- **CR Guideline 2.6:** Provide annual cultural resource training to park staff members. Ensure that SVRA field staff, such as maintenance and trails team members, understand the procedures for what to do if cultural resources, and most importantly human remains, are inadvertently discovered during a project or a park visitor. Involve local California Native American guest speakers as participants in annual cultural resource training to share and teach park staff members about today's local Native American population, their heritage, and the important role of cultural resource management in protecting their heritage. Inform SPPOs about the location of known cultural resources most susceptible to looting, vandalism, or damage by park visitors so that they can monitor site conditions and watch for site impacts and vandalism. Ensure that SPPOs have the latest information on current cultural resource laws.

- **CR Guideline 2.7:** Maintain the existing California Archaeological Site Stewardship Program (CASSP), which includes ongoing site monitoring of known cultural resources conducted by trained volunteers. Provide annual CASSP training workshops that continue to educate CASSP volunteers in the basic fundamentals of archaeological methods to expand their archaeological monitoring skill sets. Involve the local California Native American tribes and individuals in CASSP and/or participation in the annual training opportunities so that they can be involved in monitoring and learning about their heritage sites.

- **CR Guideline 2.8:** Prohibit permanent modifications that would result in the destruction of cultural resources that the State Historic Preservation Officer has determined ineligible for listing in the NRHP or CRHR, but that are considered important because of their interpretive or potential archaeological values. Minimal facilities or nonpermanent activities could be allowed on or near these sites.

- **CR Guideline 2.9:** If cultural resources are inadvertently discovered during construction activities, cease construction activities within and in the vicinity of the find and consult an OHMVR Division archaeologist or other qualified cultural resource professional to determine the potential NRHP eligibility/CRHR significance of the find. If the find is determined to be significant, develop and implement mitigation measures in consultation with the qualified state archaeologist or cultural resource professional consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Mitigation measures could include, but would not necessarily be restricted to, redesign to avoid the resource, archival research, additional in-field documentation, interpretive signage, or data recovery through excavation. If data recovery is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, should be prepared and adopted before any excavation. If the discovery is determined not to be eligible for listing in the NRHP or CRHR, then no further investigations or mitigation of adverse effects is necessary.

- **CR Guideline 2.10:** Maintain appropriate confidentiality of all cultural resource descriptions, locations, and results of Native American consultation in conformance with Government Code Section 6254.10. This applies to archaeological site information maintained by State Parks, the State Historical Resources Commission, or the State Lands Commission.

- **CR Guideline 2.11:** In the event that human remains are discovered during project activities, temporarily halt all work at the discovery location and areas adjacent to the find. Leave any human remains and associated artifacts and features in place; avoid cleaning, photographing, or analyzing human remains or associated artifacts and features, and avoid removing them from the site. The State Parks employee or construction contractor must immediately contact the State Park District Superintendent to inform him/her of the find. The State Parks District Superintendent (or designee) will notify the county coroner, in accordance with Section 7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (NAHC) will be notified within 24 hours of the discovery if the coroner determines that the remains are Native American. In compliance with PRC Section 5097.98, the NAHC will immediately notify those person(s) believed to be the most likely descendant (MLD) of the deceased Native American. The MLD will complete his/her inspection and make recommendations for treating or disposing the human remains or associated grave goods. If a Native American monitor is at the park at the time of the discovery, and that person has been designated the MLD by the NAHC, the monitor, as a representative of the MLD, may make a recommendation of the appropriate disposition. Work will not resume in the area of the find until proper disposition is complete (PRC Section 5097.98).

- **CR Guideline 2.12:** Identify all the stakeholders and provide opportunities for their input through a semi-annual meeting designed to enhance all the recreational opportunities within the SVRA. Cultural resources management efforts are most successful when a local community is interested in preserving their values. Developing cultural resources management policies and strategic actions with partners and stakeholders demonstrates the intrinsic value of historical resources. Proactive management and diverse interpretation will help turn increased awareness into more enthusiastic partnerships.

CR Goal 3: Consult with the Muwekma Ohlone, Mutsun Ohlone, Northern Valley Yokuts, and Miwok to identify ethnographic resources in Carnegie SVRA.

- **CR Guideline 3.1:** Conduct ethnographic studies using the historical accounts and ethnographic records of local California Native American groups (Muwekma Ohlone, Mutsun Ohlone, Northern Valley Yokuts, and Miwok) to identify and protect traditional cultural places, including sites of special cultural and/or religious significance that are located within Carnegie SVRA.

- **CR Guideline 3.2:** Identify and record traditional cultural places located within Carnegie SVRA in consultation with the local California Native American groups (Muwekma Ohlone, Mutsun Ohlone, Northern Valley Yokuts, and Miwok).

- **CR Guideline 3.3:** Develop interpretation and education programs in conjunction with the California Native American groups (Muwekma Ohlone, Mutsun Ohlone, Northern Valley Yokuts, and Miwok) to highlight their culture (both past and present), and their long-time use and association of areas within Carnegie SVRA.

- **CR Guideline 3.4:** Inform the local California Native American tribes and individuals that access and use of culturally significant and sacred sites within Carnegie SVRA will occur in compliance with State Parks' Native American consultation policy (Departmental Notice 2007, *Native American Consultation Policy and Implementation Procedures*) and with PRC Section 5097.9.

CR Goal 4: Ensure that natural and cultural material and object collections at Carnegie SVRA have a specific connection to the SVRA's natural and cultural history or provide support for interpretive themes and programs. Archaeological and paleontological materials, natural-history specimens of park flora and fauna, and historic objects such as furnishings, equipment, or personal items associated with the SVRA are all potential collection items.

- **CR Guideline 4.1:** After completion of the General Plan, develop a Scope of Collections Statement that describes the existing collections, their history, and uses, as well as development and management goals for these and future collections.

- **CR Guideline 4.2:** Update the Scope of Collections Statement periodically to provide clear guidelines on which objects to seek, acquire, decline, or deaccess.

- **CR Guideline 4.3:** Acquire, collect, and when necessary, preserve the archaeological, historic, and natural history materials, objects, and specimens that support interpretive themes and programs relevant to the SVRA's prehistory, ethnography, history, and natural resources, in accordance with the guidelines established in the Scope of Collections Statement.

- **CR Guideline 4.4:** Preserve archaeological, historic, and natural materials found within the SVRA. Curate these collections at State Parks' California Statewide Museum Collections Center, or at a district curatorial facility/location if appropriate space is not available at the SVRA.

- **CR Guideline 4.5:** Establish safe and secure spaces for curation and display of the SVRA's collections. Follow the policies and procedures for management of collections as outlined in Chapter 2000, "Museum Collections Management," of State Parks' Department Operations Manual.

- **CR Guideline 4.6:** Consider transfer to a more suitable park unit or possible deaccession of previously acquired collection items that do not meet these guidelines or the Scope of Collections Statement guidelines.

INTERPRETATION AND EDUCATION

SVRA INTERPRETIVE SIGNIFICANCE

Corral Hollow Canyon is a microcosm of California history. California's Native people have lived in the area, and they used the canyon for trade and ceremony. Spanish explorers passed through, and prospectors going to the southern mines stopped at the Zink House on their way. Sheep grazed in the hills until the Industrial Revolution brought coal mining and brick making to the canyon. In the early 20th century, motorcycle enthusiasts began to test their skills against Corral Hollow's rugged terrain, including climbing the steep hills, and a new form of recreation took hold.

Carnegie SVRA, like all SVRAs, faces the challenge of providing high-quality recreation while protecting the cultural and natural resources of the SVRA. Interpretation is a key factor in helping SVRA visitors appreciate the land on which they recreate, and to foster in them an appreciation for the SVRA and a desire to protect it.

SVRA INTERPRETIVE MISSION

The interpretive mission of Carnegie SVRA is to inspire visitors to pursue high-quality recreational opportunities while protecting the SVRA's resources. By understanding Carnegie SVRA's rich natural and cultural history, visitors will feel a connection to the land on which they recreate, which will inspire them to recreate responsibly. Carnegie SVRA's interpretation also will connect local communities to recreational opportunities and educational resources within the park.

SVRA INTERPRETIVE VISION

High-quality interpretation at Carnegie SVRA will encourage SVRA visitors to intelligently collaborate with staff members on resource protection. Visitors and local communities will become knowledgeable about Carnegie SVRA's resource protection. Visitors and local communities will become knowledgeable about Carnegie's resources and feel pride of ownership, a sense of belonging, and a new sense of who they are by understanding where they recreate.

INTERPRETIVE PERIODS

PRIMARY INTERPRETIVE PERIODS

- *1890–1911:* San Francisco and San Joaquin Coal Mining Company, Carnegie Brick and Pottery, and the towns of Tesla and Carnegie

- *1940s–present:* Off-highway motor vehicle use in Corral Hollow Canyon

SECONDARY INTERPRETIVE PERIODS

- *8,000 years ago to 1769:* Use of the canyon by California Native Americans for hunting, gathering, trading, and ceremonies

- *1776:* Juan Bautista de Anza expedition
- *1849–1850:* Gateway to the southern gold fields and founding of Zink House
- *1850s–1890:* Sheep ranching and early coal mining
- *1912–1939*: Grazing

THEMES

UNIFYING THEME

Carnegie SVRA provides high-quality recreation for OHV enthusiasts while balancing the need to preserve the park's natural and cultural resources for the inspiration and education of the public. Careful management and protection of these resources by park staff in cooperation with the OHV community is the key to maintaining and enhancing recreation at Carnegie SVRA for years to come.

PRIMARY THEMES

OFF-HIGHWAY VEHICLES

- Carnegie SVRA is a fun and enjoyable place to learn about OHV safety and how to recreate responsibly.
- Carnegie SVRA provides quality opportunities for responsible recreation across the OHV spectrum for fun, health, and the inspiration of park visitors.
- Carnegie SVRA is a place where OHV history has been made, and where families and individuals will continue to make their own history for generations to come.

RESOURCE MANAGEMENT

- Carnegie SVRA ensures quality recreational opportunities while caring for the needs of the plants and animals that call Carnegie SVRA home, protecting the quality of the water and the air, and protecting the area's cultural heritage.
- Carnegie SVRA staff educate visitors about responsible riding and share information about the SVRA's extensive resource inventory, monitoring, protection, and restoration efforts.

HISTORY

- Carnegie SVRA has a long and interesting history of resource uses. Corral Hollow Canyon's resources of coal, clay, and sand made it a hub of California's early industrial network.
- Rich clay and sand deposits supplied a growing state with bricks and glass while rare coal provided a much-needed fuel source.
- The towns of Carnegie and Tesla developed to support the industries in Corral Hollow Canyon.

- The early 20th century was a time of rapid change; the towns of Carnegie and Tesla disappeared as other industries, resources, and technologies replaced the mine's products.

Secondary Themes

History

Many feet have passed through Corral Hollow Canyon, from Native people visiting for hunting, gathering, trading, and ceremony to Spanish explorers mapping travel routes, to gold miners heading for the southern mines, to modern-day commuters heading to and from work. All of these people have left their mark on the canyon as they have passed through.

Local Plants and Animals

- Plants and animals have to be tough to survive in Corral Hollow's dry environment.
- The area presents a transitional zone between the moister coastal areas and the dry interior valley.

Interpretive and Educational (IE) Goals and Guidelines

IE Goal 1: Provide relevant and thematic interpretive materials that address the SVRA's sense of place and history and meet the needs and interests of the visitors.

- **IE Guideline 1.1:** Develop an interpretation master plan (IMP) for the SVRA as a long-range master plan for interpretation. The IMP shall expand upon the goals and guidelines identified in this General Plan and provide greater background and context. It shall define the objectives, methodologies, and concepts for how the goals stated in the General Plan will be achieved. The IMP shall analyze existing interpretive conditions and explore opportunities and constraints for expanding interpretation, safety and conservation messaging, and visitor outreach.

- **IE Guideline 1.2:** Ensure that interpretation is engaging for all by addressing multiple learning styles, incorporating modern technology, and accommodating people with diverse abilities through varied interpretation techniques and media.

- **IE Guideline 1.3:** Involve local community organizations, including local California Native American tribes (Muwekma Ohlone, Mutsun Ohlone, Northern Valley Yokuts, and Miwok) and individuals, in the creation of natural and cultural interpretive programs that are attractive to SVRA visitors.

- **IE Guideline 1.4**: Identify opportunities to incorporate the historical resources into interpretive OHV trails. Provide interpretive signs to protect and preserve the historical resources while highlighting the multiple uses of the SVRA. Encourage visitors to be a part of the physical, social, and cultural aspects of the heritage visible throughout the SVRA.

- **IE Guideline 1.5:** Allow visitors to experience the landscape at trailside interpretive signs and overlooks. Develop areas near trails that have opportunities to overlook the vast natural and cultural landscape. Providing electronic and alternative methods to access interpretive information will reduce

the size and complexity of interpretive displays while lowering the costs of acquisition and maintenance.

- **IE Guideline 1.6:** Increase the awareness of the historical significance of the SVRA through web-page development. Provide guidance for exploring the history of the SVRA. Develop online parkwide messaging for the public that includes the various opportunities, and incorporate the historical significance of the SVRA within the message.

- **IE Guideline 1.7:** Ensure that future educational and recreational planning efforts consider appropriate and safe opportunities while reducing potential risks to visitors.

IE Goal 2: Increase visitors' knowledge of and appreciation for recreational opportunities at the SVRA and in the region.

- **IE Guideline 2.1:** Educate visitors about the diversity of recreational experiences currently offered within the SVRA. Once facilities envisioned in this General Plan become available, provide information about new and expanded recreational opportunities and interpretive programs.

IE Goal 3: Expand understanding of ecological relationships and heighten awareness of and sensitivity to human impacts.

- **IE Guideline 3.1:** Work with interested parties to provide education about the natural ecosystem processes at the SVRA.

- **IE Guideline 3.2:** Provide opportunities for visitors to gain an understanding of the SVRA's diverse natural resources. Interpret local ecology and explain vulnerabilities of sensitive biological resources to human disturbance.

- **IE Guideline 3.3:** Highlight opportunities for OHV recreationists to minimize their impacts on natural resources through engaging, creative interpretive programming. Provide information about temporary and rotating area closures to encourage visitors to allow natural regenerative processes to occur in these areas; foster an understanding about the benefits of these closures.

- **IE Guideline 3.4:** Provide opportunities for visitors to gain an understanding of regional and local water quality issues, including the importance of water quality protection measures being implemented at the SVRA. Interpret the on-site surface water drainage system and include information on potential water quality pollution sources, about infiltration properties of the local soils, and about the importance of on-site treatment measures (e.g., sediment basins, vegetative buffers).

- **IE Guideline 3.5:** Promote water conservation on-site, for both visitor use and operational purposes.

- **IE Guideline 3.6:** Interpret sustainability initiatives and inspire SVRA visitors to adopt similar measures in their daily lives, including during OHV recreation.

IE Goal 4: Promote safe and responsible OHV recreation.

- **IE Guideline 4.1:** Work with interested parties to develop interpretive resources, programs, and opportunities regarding safe and responsible OHV recreation.
- **IE Guideline 4.2:** Use a broad range of interpretive techniques to deliver SVRA information and public safety messages, such as responsible riding.
- **IE Guideline 4.3:** Explore training programs that lead to ATV Safety Institute safety certification for adults and youth.
- **IE Guideline 4.4:** Collaborate with organizations such as the Motorcycle Safety Foundation and the ATV Safety Institute to provide additional opportunities for safety certification.
- **IE Guideline 4.5:** Expand opportunities for underserved youth, including the "Off-Highway PALs" program for youth, at the SVRA to teach safe, responsible OHV operation and provide opportunities for positive interactions with law enforcement officers.
- **IE Guideline 4.6:** Maintain and provide a public list of medical or public emergency training resources.

PARK OPERATIONS AND MAINTENANCE (OM)

OM Goal 1: Provide visitor services and infrastructure that encourage responsible visitor use of Carnegie SVRA and meet visitor needs.

- **OM Guideline 1.1:** Provide utilities to meet the daily needs of staff members and visitors for existing facilities and new ones envisioned in this General Plan.
- **OM Guideline 1.2:** Investigate and implement the use of solar and other innovative and renewable technologies to provide electricity at the SVRA.
- **OM Guideline 1.3:** Promote opportunities to incorporate sustainability into SVRA development, operations, and maintenance. Sustainability initiatives could include supporting and encouraging the use of electric vehicles, promoting energy efficiency, using reclaimed water, and applying energy efficiency and green building standards to new construction and other initiatives that may be developed in the future.
- **OM Guideline 1.4:** Following construction of additional recreation facilities, provide adequate funding and staffing to operate the SVRA in a safe and efficient manner.

OM Goal 2: Maintain and enhance the quality of OHV recreational opportunities.

- **OM Guideline 2.1:** To increase recreational opportunities, provide recreation opportunities that expand the area of OHV recreation at the SVRA, and provide opportunities for a full range of OHV types and for the full range of skill levels.
- **OM Guideline 2.2:** Partner with organizations to enhance the OHV recreation experience with activities such as OHV events for kids, education and interpretive activities, and OHV races.
- **OM Guideline 2.3:** Monitor visitation patterns at Carnegie SVRA and implement management actions that respond to these trends while remaining consistent with the General Plan's vision, goals, and guidelines.
- **OM Guideline 2.4:** Provide SVRA park maps and trail signs that help visitors easily understand the allowable recreational activities within the different visitor experience areas.

OM Goal 3: Provide facilities and services that contribute to the safety and convenience of visitors and staff.

- **OM Guideline 3.1:** Provide signage to inform visitors of responsible OHV recreation practices and extreme temperature precautions.
- **OM Guideline 3.2:** Ensure that recreation areas are maintained properly and monitor for hazards. Close areas with unsafe conditions until improvements are completed; close areas with unauthorized trails and restore these areas.
- **OM Guideline 3.3:** Provide clear signage and/or fencing as appropriate around areas of known potential hazard, such as deep gullies, drop-offs, or restricted areas such as the Tesla Coal Mine Site.
- **OM Guideline 3.4:** Construct, maintain, and operate all facilities in compliance with all federal, state, and local regulatory requirements regarding the handling and disposal of hazardous materials for the protection of surface water and groundwater, soils, and people.
- **OM Guideline 3.5:** Prevent accidental fire ignition and spread of wildfire to adjacent areas by monitoring OHVs for spark arresters and by monitoring fuel handling practices.
- **OM Guideline 3.6:** Design and maintain all access roads and entrances according to applicable safety standards.
- **OM Guideline 3.7:** Provide signage directing visitors to exit points for ease of egress in case of emergency.
- **OM Guideline 3.8:** Clearly post the hours of operation, including seasonal changes, and enforce as applicable.

- **OM Guideline 3.9:** Plan and design facilities to allow ease of access for emergency personnel and to allow a clear view of visitors by SPPOs. Locate restroom facilities in visible locations; avoid locating restroom facilities in remote locations.

- **OM Guideline 3.10:** Ensure that supplies of emergency response materials kept on-site are adequate and easily accessible. Ensure that staff members are adequately trained in emergency response practices.

- **OM Guideline 3.11:** Promptly clean up and dispose of trash and hazardous spills for the health and safety of the environment and the public and to encourage good visitor stewardship of the SVRA.

- **OM Guideline 3.12:** Use animal-proof trash cans and recycling containers.

- **OM Guideline 3.13:** Continue to coordinate with state and local districts and agencies for emergency response.

- **OM Guideline 3.14:** Mark the boundaries of the SVRA and the different visitor experience areas (if applicable) clearly with signs, fences, barriers, or a combination. Signs must be clearly visible to, and worded for, the benefit of SVRA visitors. Identify use areas and appropriate uses in visitor maps.

OM Goal 4: Coordinate with special-event sponsors to ensure that special events are well managed and that appropriate visitor services are available.

- **OM Guideline 4.1:** Coordinate with sponsoring organizations regarding scheduling, operations, and management of special events. Issue a special-event permit to event coordinators that details sponsor obligations.

- **OM Guideline 4.2:** Design and implement parking management plans to accommodate increased demand during special events.

- **OM Guideline 4.3:** During special events, implement traffic dust control measures in dirt parking areas and and parking measures, such as clearly defined staging and unloading areas for OHVs, designated parking areas for large vehicles and trailers, defined parking lots for regular-sized vehicles, designated emergency vehicle parking and access routes, and barricades to direct vehicles and pedestrians. Provide travel and parking information in special-event publications.

- **OM Guideline 4.4:** Anticipate and accommodate an increased need for restroom facilities during special events, according to standard ratios stipulated in the special-event permit.

- **OM Guideline 4.5:** Plan and design facilities and utilities to accommodate concessionaires at special events.

OM Goal 5: Develop and maintain SVRA facilities and monitor OHV activities to ensure compatibility with surrounding land uses.

- **OM Guideline 5.1:** Manage the SVRA in a manner that honors existing easements and does not adversely affect easement use by the respective parties.

- **OM Guideline 5.2:** Require that noise levels not exceed applicable jurisdiction (county) noise standards for 24-hour exposure at or beyond the boundary line of the SVRA. In the SVRA, similar limits shall be met in areas of permanent human habitation (e.g., residences). All vehicles operating in the SVRA shall meet applicable noise limits set in the California Vehicle Code.

- **OM Guideline 5.3:** Employ practices to reduce noise levels for noise-sensitive receptors during construction of facilities. Reduce noise generated during construction and maintenance activities by:

  - properly maintaining equipment with noise-reduction devices in accordance with manufacturer specifications (e.g., mufflers, shrouds, filters);
  - using quieter than standard equipment when possible (e.g., electrically powered equipment);
  - limiting activities to between 8:00 a.m. and 6:00 p.m., Monday through Saturday (excluding emergency work);
  - restricting equipment travel and use within 500 feet of noise-sensitive receptors, unless the equipment used would not exceed the daytime standard of 50 A-weighted decibels day-night average sound level (dBA L_{dn}) and the nighttime standard of 45 dBA L_{dn} at the property line of noise-sensitive receptors;
  - turning off equipment during prolonged periods of nonuse;
  - restricting alarms to warn of safety issues only;
  - using noise-attenuating buffers when activities take place within 500 feet of adjacent sensitive receptors (e.g., berms, stationary barriers, noise blankets, shrouds);
  - following standard construction practices;
  - locating equipment staging areas and material loading and unloading zones greater than 500 feet from the nearest sensitive receptor;
  - using rubber-tired equipment as much as feasible to minimize groundborne noise; and
  - locating any stationary noise sources (e.g. generators) within noise enclosures.

- **OM Guideline 5.4:** Maintain the fencing and required buffer areas between Carnegie SVRA and adjacent properties to minimize conflicts and prevent OHV use where it is not allowed.

- **OM Guideline 5.5:** Place rest areas and steep uphill grades at locations to provide a barrier effect and/or increase the distance to noise-sensitive uses.

- **OM Guideline 5.6:** Subject to existing law, require mufflers that are consistent with the equipment manufacturer's specifications (original equipment or equivalent).

OM Goal 6: Limit potential air quality impacts on residential properties within the planning area that could result from construction, maintenance, and OHV recreation activities.

- **OM Guideline 6.1:** Implement Bay Area Air Quality Management District (BAAQMD) basic construction measures for all projects:

    - All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

    - All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

    - All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

    - All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

    - Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, California Code of Regulations Title 13, Section 2485). Clear signage shall be provided for construction workers at all access points.

    - All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.

    - A publicly visible sign shall be posted at the soil transfer site within BAAQMD, with the telephone number and person to contact at Alameda County regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number also shall be visible, to ensure compliance with applicable regulations.

- **OM Guideline 6.2:** Implement BAAQMD additional construction measures as necessary for projects with construction emissions above the BAAQMD thresholds of significance:

    - All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.

    - All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- The idling time of diesel powered construction equipment shall be minimized to 2 minutes.
- The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a projectwide fleet-average 20 percent reduction in emissions of oxides of nitrogen (NO_X) and 45 percent reduction in particulate matter (PM) emissions compared to the most recent California Air Resources Board (ARB) fleet average. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
- Low–volatile organic compound (i.e., reactive organic gas) coatings shall be used beyond the local requirements (i.e., Regulation 8, Rule 3, "Architectural Coatings").
- All construction equipment, diesel trucks, and generators shall be equipped with best available control technology for emission reductions of NO_X and PM.
- All contractors shall use equipment that meets ARB's most recent certification standard for off-road heavy-duty diesel engines.

► **OM Guideline 6.3:** Implement San Joaquin Valley Air Pollution Control District (SJVAPCD) Regulation VIII control measures for construction emissions of respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}) (required for all construction sites):

- All disturbed areas, including storage piles, that are not being actively utilized for construction purposes shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, and covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions through application of water or presoaking.

- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.

- When materials are transported off-site, all material shall be covered or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained.

- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.

- Following the addition of materials to or the removal of materials from the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.

- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles, shall implement measures to prevent carryout and trackout.

▸ **OM Guideline 6.4:** Implement SJVAPCD enhanced additional control measures for construction emissions of PM_{10} as necessary:

- Enhanced control measures (to mitigate PM_{10} impacts):

  – Limit traffic speeds on unpaved roads to 15 mph.

  – Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.

- Additional control measures (for projects that are large in area or located near sensitive receptors, or that for any other reason warrant additional emissions reductions):
  - Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
  - Install wind breaks at windward side(s) of construction areas.
  - Suspend excavation and grading activity when winds exceed 20 mph.[1]
  - Limit the area subject to excavation, grading, and other construction activity at any one time.

- **OM Guideline 6.5**: Implement SJVAPCD construction equipment mitigation measures (to reduce exhaust emissions) for all projects:
  - Use alternative-fueled or catalyst-equipped diesel construction equipment.
  - Minimize idling time (e.g., 5-minute maximum).
  - Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.
  - Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).
  - Curtail construction during periods of high ambient concentrations of pollutants; this may include ceasing construction activity during the peak hour of vehicular traffic on adjacent roadways.
  - Implement activity management (e.g., rescheduling activities to reduce short-term impacts).

- **OM Guideline 6.6:** Maintain a buffer of at least 250 feet around any residential properties within the planning area during and after implementation of the General Plan.

- **OM Guideline 6.7:** Conduct an environmental analysis for all construction projects located within 1,000 feet of any residents (on-site or off-site) to assess potential air quality impacts of construction-related emissions on the existing residence(s). If any significant impacts are determined pursuant to the applicable air district thresholds of significance (i.e., BAAQMD or SJVAPCD), the applicant and contractor shall implement all necessary measures to minimize emissions.

OM Goal 7: Manage the SVRA to reduce to reduce regional air quality impacts from OHV recreation activities.

- **OM Guideline 7.1:** Prohibit OHV recreational activities within Carnegie SVRA on summer Spare the Air days designated by BAAQMD or SJVAPCD under their respective Healthy Air Living

[1] Regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation.

initiatives. Clearly post summer Spare the Air day alerts on the SVRA website on the soonest possible date, and send notifications through the listserv to avoid visitors unnecessarily traveling to the project site.

- **OM Guideline 7.2:** Provide regional air quality information (e.g., basics of air quality, local ambient pollutant concentrations, summer Spare the Air day alerts) on the website and at the SVRA entrance. Materials could include but are not limited to educational information about fugitive dust and ozone precursors, low-emission OHV engines and models, and health risk exposure.

- **OM Guideline 7.3:** During high-wind conditions, prohibit additional OHVs from entering the recreational trails and OHV areas.

OM Goal 8: Manage the SVRA to maintain current aesthetic qualities and reduce visual impacts on surrounding areas that could result from construction, maintenance, and OHV recreation activities.

- **OM Guideline 8.1:** Design any new structures such that they are similar in height and scale to existing structures at the SVRA, and have an architectural style similar to the existing structures. Locate facilities with minimal impact on the viewshed. Utilize California native plant and tree species as necessary to screen new facilities from views.

- **OM Guideline 8.2:** Implement the following actions to minimize potential light pollution or glare that could result from lighting for nighttime activities and security:

  - Include shielding on any new light fixtures.

  - Angle any new light fixtures downward to provide light spillover into adjacent areas.

  - Avoid the use of reflective surfaces, such as tin roofs or reflective glass that could produce glare, on any new structures.

4.4.2 Use Area Goals and Guidelines

No specific use area goals and guidelines are included in this General Plan. The goals and guidelines outlined in Section 4.4.1 apply to all use areas. Specific consideration for certain use areas beyond those goals and guidelines are included in Table 4-1 above.

4.4.3 Continued Planning and Issue Resolution

Upon adoption of this General Plan and certification of the associated environmental impact report, site-specific planning may move forward and more detailed plans and specific projects envisioned in this General Plan may be implemented. Future projects will require project-specific review pursuant to the California Environmental Quality Act and may require project-specific permits.

Planning topics that will likely evolve over the life span of this General Plan are expected to include those related to the regulation of protected resources such as biological resources, water quality and supply, cultural resources, air quality and noise; issues related to climate change; issues related to population growth/change; and issues related to new forms of recreation and fluctuation of user volumes in relation to age demographics and the economy. The goals and guidelines in this General Plan have been developed to be flexible in adapting to future change and, where applicable, call for the implementation of the most recent standards related to resource management and protection.

4.5 MANAGING VISITOR CAPACITY

To comply with PRC Section 5019.5, State Parks must assess carrying-capacity issues when drafting general plans. State Parks defines "carrying capacity" as a prescribed number and type of visitors that an area will accommodate given the desired natural/cultural resource conditions, visitor experiences, and management programs.

4.5.1 METHODOLOGY

State Parks defines "visitor capacity management" as:

> A methodology used to determine and maintain the desired resource and social conditions that fulfill the purpose and mission of a park. It includes establishing initial visitor capacities, then monitoring key indicators in order to identify appropriate management actions in response to unacceptable conditions.

An adaptive management process recognizes that management actions will have uncertain outcomes, and thus, that adjusting management and research decisions throughout the process to better achieve management objectives is important. The steps that typically compose an adaptive management process for State Parks are presented below. Steps 1–3 have been completed as part of the General Plan preparation process. Steps 4–7 should be implemented over time, as the goals and guidelines identified in this General Plan are implemented.

STEP 1. IDENTIFY EXISTING OPPORTUNITIES AND CONSTRAINTS

Existing opportunities and constraints are documented in Chapters 2 and 3 of this General Plan.

STEP 2. DETERMINE VISION AND DESIRED CONDITIONS

The vision and goals for the General Plan were created based on review of the original Carnegie SVRA General Plan, and of the issues and opportunities identified during the planning process, research on existing conditions, input from OHMVR Division staff members, and public and agency input.

STEP 3. IDENTIFY ISSUES AND EVALUATE ALTERNATIVES

The evaluation of planning concepts was a key step in the decision-making process toward developing this General Plan. Planning concepts were developed to illustrate different scenarios for how Carnegie SVRA may evolve over the long term. The planning concepts were analyzed to identify which combination of options best serves Carnegie SVRA's purpose and vision, the goals of the OHMVR Division Strategic Plan, and the public's interest in Carnegie SVRA's future.

STEP 4. DEVELOP MEASURABLE INDICATORS

Key indicators that can diagnose whether the desired conditions for an SVRA are being met were developed as part of the General Plan process. These indicators are presented in Table 4-2 below.

STEP 5. ESTABLISH INITIAL VISITOR CAPACITIES

Initial visitor capacities should be formulated based on an analysis of existing conditions, alternative considerations, desired future conditions, and prescribed goals and objectives. Because the number of visitors that Carnegie SVRA can support at any given time will depend on a variety of factors, the SVRA can be better managed through an adaptive management process, rather than by assigning a specific, quantifiable visitor capacity threshold. These factors include management actions such as operational decisions, oversight practices of the SPPOs, and resource management. Therefore, the visitor capacity of Carnegie SVRA is addressed in terms of desired outcomes and indicators. For example, visitor attendance could be considered within capacity if Carnegie SVRA receives successful assessments relative to the indicators provided below. Initial visitor capacity is presented in terms of positive indicators in Table 4-2.

STEP 6. MONITOR USE AND IDENTIFY CHANGING CONDITIONS

The guidelines listed below provide a framework for monitoring potential impacts on or changes at Carnegie SVRA. The indicators identified in this section will be used to determine when an unacceptable condition exists and management actions are necessary.

STEP 7. ADJUST ENVIRONMENTAL OR SOCIAL CONDITIONS

This section includes guidelines to be implemented by Carnegie SVRA management staff members if monitoring efforts reveal that environmental or social conditions may be approaching or exceeding the thresholds established under Step 4, above.

4.5.2 VISITOR MANAGEMENT (VM) GOAL AND GUIDELINES

VM Goal 1: Establish and implement an adaptive management process for managing visitor capacity at Carnegie SVRA in support of the SVRA's purpose and vision.

- **VM Guideline 1.1:** Consider SVRA monitoring data and associated management recommendations before making management and improvement decisions.

- **VM Guideline 1.2:** If monitoring efforts reveal that conditions are approaching or exceeding thresholds, consider alternatives and take appropriate action. Adjust management actions to direct resource and visitor experience conditions to the desired state. Potential indicators and actions presented in this plan should be updated as necessary.

Table 4-2. Desired Outcomes and Indicators for Visitor Capacity

Goals and Guidelines	Desired Outcomes	Indicators (Environmental and Social)	Potential Management Actions and Monitoring Activities
Visitor Experience and Opportunity			
VEO Goal 1: When planning for recreation opportunities and visitor experiences, provide a broad range of OHV recreation experiences and opportunities for visitors to enjoy and appreciate.	A variety of OHV, recreational, and educational activities that enhance the appreciation and enjoyment of the SVRA's resources while balancing the protection needs of environmental resources.	Presence of returning SVRA visitors. Diversity of recreation activity throughout the SVRA. Diversity in park visitation demographics. Conflict among SVRA visitors and differing recreation activities. Effects on SVRA resources with increases in SVRA visitation.	Implement the adaptive management process as part of SVRA operations. Observe SVRA resources and visitor activity during day-to-day operations. Design facilities for visitor needs. Conduct visitor satisfaction surveys. Evaluate new recreation opportunities, trends, and activities. Respond to changing visitor demographics. Implement a facility maintenance plan, as appropriate.
Natural Resource Management			
NRM Goal 1: Manage Carnegie SVRA for a balance of uses that allow protection and stewardship of natural resources while maintaining a quality OHV recreational experience.	Reasonable balance between OHV recreation opportunities and the protection of special-status species and native habitats. Minimization of soil erosion in key/sensitive areas.	Occurrence of special-status species. Presence of suitable wildlife habitat. Abundance of prey species. Reporting of periodic sightings of plants or wildlife. Presence of healthy plant communities. Occurrence of special-status plant or wildlife species. Lack of OHV damage to habitats and species in protected areas. Change in trail difficulty and/or safety conditions caused by erosion. Visible water quality sedimentation or pollution.	Establish and enforce OHV use in designated areas that are located outside of known occurrences of special-status species and habitat. Implement adaptive management measures based on information from the HMS. Use interpretive/educational signage and fencing in select areas to inform visitors and protect particularly sensitive areas. Regularly evaluate the condition of visitor experience. Identify all factors contributing to a given area with an erosion problem. Temporarily or permanently close certain trails or portions of the SVRA if necessary.
Cultural Resources			
CR Goal 2: Protect, stabilize, and preserve cultural resources.	Retention of the integrity and value of cultural resources.	Disturbance to known cultural resource sites. Discovery of and disturbance to previously undiscovered cultural resource sites.	Survey, record, and evaluate areas of high probability for the presence of prehistoric and historic-era archaeological sites. Establish criteria of significance for each class of resource. Conduct additional historic research and evaluate the known historic-era sites and areas of historic-period activity.

Table 4-2. Desired Outcomes and Indicators for Visitor Capacity

Goals and Guidelines	Desired Outcomes	Indicators (Environmental and Social)	Potential Management Actions and Monitoring Activities
			Monitor SVRA resources during daily operations to identify impacts of visitor activity and natural processes on resources. Use fencing, protective soil, and/or signage to prevent damage or loss of cultural resources. Use adaptive management to ensure preservation and protection of sites.
Visitor Management			
VM Goal 1: Establish and implement an adaptive management process for managing visitor capacity at Carnegie SVRA in support of the SVRA's purpose and vision.	Management actions that reflect current conditions and management lessons learned.	Updated indicators and actions for adaptive management process.	Create a checklist of actions required for a successful adaptive management process. Review SVRA monitoring data and associated management recommendations before making management and improvement decisions.

Notes: HMS = Habitat Management System; OHV = off-highway vehicle; SVRA = State Vehicular Recreation Area

Source: Data provided by State Parks and compiled by AECOM in 2014

CHAPTER 5 – REFERENCES

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5.2 CHAPTER 2, "EXISTING CONDITIONS"

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