

Concord Hills Regional Park

LAND USE PLAN

2020

APPENDICES

East Bay 
Regional Park District
Healthy Parks Healthy People



Photos: Stephen Joseph

**CONCORD HILLS REGIONAL PARK
LAND USE PLAN | APPENDICES**

**APPENDIX A
PUBLIC MEETING SUMMARIES**

CONCORD HILLS REGIONAL PARK LAND USE PLAN

WORKSHOP SUMMARY

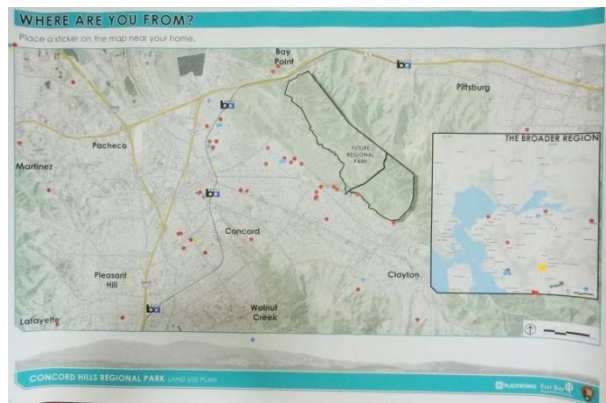
Public Meeting #1: Vision

Concord Senior Center | 2727 Parkside Circle | Concord, CA 94519

July 23, 2015 | 6:30- 8:30pm

EVENT OVERVIEW

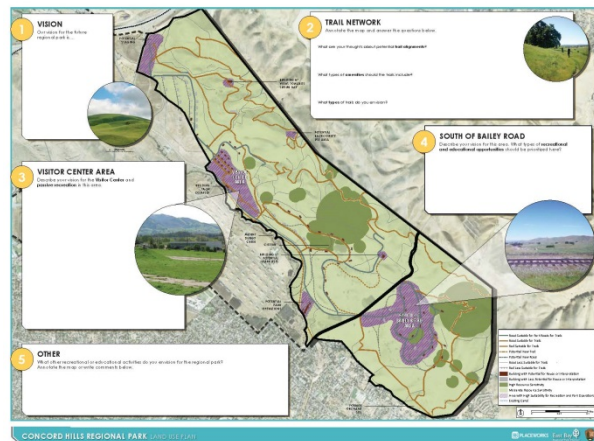
Approximately 90 members of the public participated in a workshop to envision the future regional park at the Concord Naval Weapons Station. The workshop included a presentation of the project from East Bay Regional Parks District, National Park Service (NPS), and PlaceWorks; three interactive board stations, and a small-group mapping activity. The first interactive boards asked people to indicate on a map where they currently live. Workshop participants came from locations around the Bay Area. Most participants were from Concord, in particular the area directly adjacent to the future regional park, and nearby cities or communities.



SMALL GROUP ACTIVITY

The small group activity included a map of the site with potential future trail and road alignments, use zones (areas with high suitability for more intensive park uses such as picnic areas and staging areas), and conservation areas (areas where recreational uses are less suitable due to higher resource sensitivity). The group was directed to annotate the map with additional features or note concerns with features shown, and to respond to the following five questions and prompts included on the map board:

1. **Vision.** Our vision for the future regional park is....
2. **Trail Network.** Annotate the map and answer the questions below.
 - What are your thoughts about potential trail alignments?
 - What types of amenities should the trails include?
 - What types of trails do you envision?
3. **Visitor Center Area.** Describe your vision for the Visitor Center and passive recreation in this area.
4. **South of Bailey Road.** Describe your vision for this area. What types of recreational and educational opportunities should be prioritized here?
5. **Other.** What other recreational or educational activities do you envision for the regional park? Annotate the map or write comments below.



Following the activity, group members reported back with a summary of their team's responses. Major themes from the input received are identified below, and a complete summary of input received on map boards and group notes is provided in Attachment A.

MAJOR THEMES

Although each small group had a unique approach to analyzing the site, there were some common themes that were carried across a variety of responses.

HISTORY

Nearly all of the small groups thought that the site should reflect the unique social and natural history of the site, with many groups emphasizing a combined interpretive approach utilizing both themes. Many groups identified the Visitor Center area as the central site for illustrating this history, although some pointed out that features in the landscape, such as historic buildings and habitat areas, would be valuable for interpretation.



ACCESS AND CONNECTIVITY

Connections to future trails and mass transit were important features to many of the groups. In particular, groups wanted to have a good connection to the North Concord BART Station and regional trails that would take people into other regional open spaces. A range of desired trail types were identified, including multi-use, single-use, and Americans with Disabilities Act (ADA) accessible trails.

Some groups wanted to significantly limit vehicular access within the park by reducing drivable roads and amenities within the interior of the site.

BALANCE PARK USE WITH CONSERVATION

Most groups highlighted the importance of utilizing the regional park for wildlife habitat and protecting plant communities, with some groups strongly recommending minimal development within the Regional Park. In particular, groups wanted to see protection of wetlands and water resources, including Mount Diablo Creek which borders the site; restoration of native oak species; and continuous habitat corridors, with one group recommending a wildlife overpass across Bailey Road to improve mobility across the busy street.

PARK AMENITIES

Within the use areas, many groups suggested picnic spaces, overnight campsites, and environmental education centers. Other amenities suggested are described below by topic:

- **Visitor Center Area.** Facilities proposed specifically for the Visitor Center Area also included rentable areas for festivals and parties, concessions (“good food”), and a theatre.
- **Camping.** Some groups utilized the area south of Bailey Road for car camping facilities, while others preferred to have only backcountry sites farther inside the site.
- **Magazines.** Potential uses identified for the magazines included rentals, storage, conferences, parties, and events.
- **Rail.** Numerous groups suggested utilizing the rail lines to create an active train ride as an activity for children or as a way to move park users through the regional park.
- **Other.** One group recommended an observatory (potentially at Building 97) and one group recommended including a performance space. Many groups emphasized the importance of having places for youth to visit, including places for scouts to come for events, such as overnight campouts. One group proposed a regional memorial for local soldiers fallen.

RESOURCE REUSE

Many groups recommended using portions of the significant legacy of infrastructure and buildings already on the regional park site for interpretive as well as operational uses. Reuse of the bunkers and buildings for education centers, campsites, and rental spaces was a common theme, and many groups noted that existing road and rail lines should be utilized for trails. As noted above, some groups wanted to reuse the rail lines for recreational train service within the park.

In addition to reuse, one group recommended recycling on-site materials by using demolition debris for new infrastructure. Specifically, the group recommended using the concrete from the existing bunkers as gravel for new trails and picnic sites.

ENVIRONMENTAL IMPACT

In regard to new regional park development, many groups emphasized that the project should utilize environmentally-conscious practices. In particular, groups wanted the regional park to use solar panels for energy production and practice water efficiency throughout any use areas.



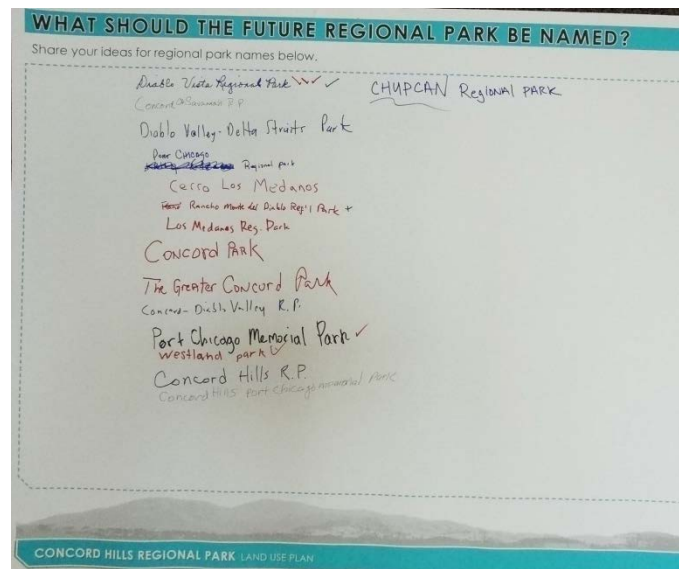
INTERACTIVE BOARDS

The interactive boards were available as the public entered the workshop and asked people to indicate on a map where they currently live (as described above), select a priority for the future regional park, and suggest potential names for the regional park.

What Should the Future Regional Park Be Named?

A blank board was provided for workshop participants to suggest potential names for the future regional park. Participants identified thirteen potential names, as listed below. Some participants placed a check mark next to the name(s) they supported, informally voting for preferred names.

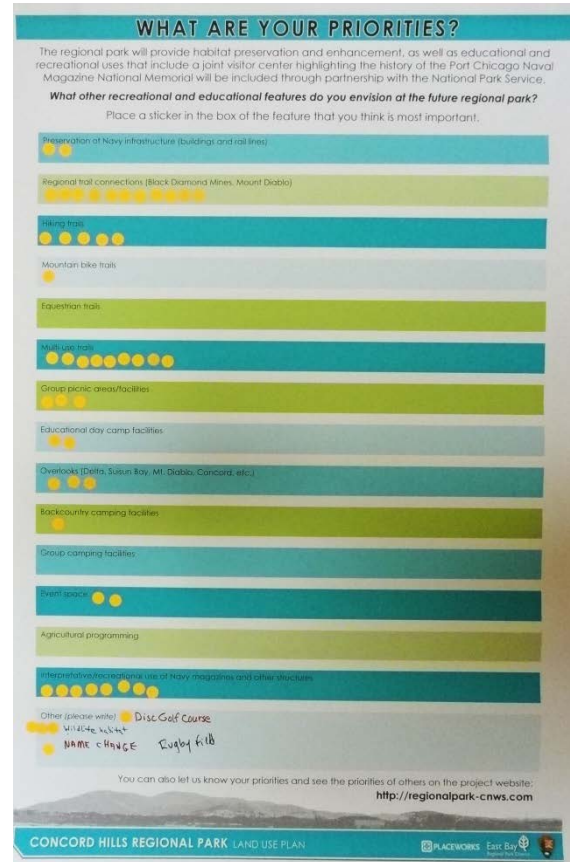
Name (number of check marks received)
Diablo Vista Regional Park (4)
Chupcan Regional Park
Concord California Savannah Regional Park
Diablo Valley-Delta Straights Regional Park
Port Chicago Regional Park
Port Chicago Memorial Regional Park (1)
Concord Hills Port Chicago Memorial Regional Park
Cerro Los Medanos
Los Medanos Regional Park
Rancho Monte del Diablo Regional Park (1)
Concord Regional Park
The Greater Concord Regional Park
Concord Hills Regional Park
Westland Regional Park (1)



Priorities

Workshop participants were given one sticker and asked to place it beside their highest priority for the future regional park. The results included:

Priority	Number of Votes
Regional trail connections (Black Diamond Mines, Mount Diablo)	11
Multi-use trails	9
Interpretative/recreational use of Navy magazines and other structures	8
Hiking trails	5
Group picnic areas/facilities	3
Overlooks	3
Preservation of Navy infrastructure (buildings and rail lines)	2
Educational day camp facilities	2
Event space	2
Backcountry camping facilities	1
Mountain bike trails	1
Equestrian trails	0
Group camping facilities	0
Agricultural programming	0
<i>Other</i>	
Wildlife habitat	3
Name change	1
Disc golf course	1
Rugby field	1



Attachment A: Small Group Activity Results

Participants were divided into nine small groups, with numbers assigned as they signed in to the meeting. Notes received from each group are included below. There was no Group #1, as some participants left early or joined different groups.

GROUP NUMBER	VISION	TRAIL NETWORK			VISITOR CENTER AREA	SOUTH OF BAILEY ROAD	OTHER	MAP NOTES
		TRAIL ALIGNMENTS	AMENITIES	TYPES				
2	<p>Preserve wildlife habitat</p> <p>History and interpretation WWII and prior</p> <p>Expand creek protection (200-300 foot buffer)</p> <p>Restore native plants</p> <p>Remove non-native grasses</p> <p>Preserve open space/viewshed along Hwy 4 corridor</p> <p>Restore oak populations</p> <p>Reduce grazing</p>	<p>Connectivity of roads to bike trails</p> <p>Trailheads at Bailey Road with facilities</p> <p>Trailhead by visitor center</p> <p>Trails connected to other parks</p>	<p>Interpretive signs</p>	<p>Maybe need to separate uses (bicycling, pedestrian, horses) – may be dependent on geography</p> <p>Night hikes to highlight wildlife</p>	<p>History of the site</p> <p>Film/theater</p> <p>Story of Port Chicago</p> <p>Picnic areas – split decision on café</p> <p>Rooms that tell different stories of the site</p> <p>Environmentally friendly – solar panels; water efficient</p> <p>Create habitat in that area</p> <p>Education about feral animal populations</p> <p>Relocate visitor center – [current location is] not easy to access without a car – consider Bailey Road for area currently identified for park operations</p>	<p>Horse trail and connectivity to other parks</p> <p>Ardenwood-like type of experience</p> <p>Kiosk/trailhead with maps for trails so don't have to go to Visitors Center</p>	<p>Dog park</p> <p>Restricting feral dog/cat access</p> <p>No pesticides</p> <p>Railroad uses – maybe a train ride, like at Tilden</p> <p>Films</p> <p>Sustainable nice yards – minimal impacts – use recycled water</p> <p>Plant/donate trees in memory of loved ones/important people</p> <p>Easy access to Visitor Center</p> <p>Fitness stations and mileage – maybe near Visitor Center</p>	<p>Bathrooms in use areas and at Bailey Road and potential staging areas</p> <p>Historic Farm area south of Bailey Road</p>
3	<p>A large regional park dedicated to providing open spaces, wildlife habitat, and low impact recreation while being extensively connected to new existing open space and trails, with easy access to new and existing residential communities, emphasizing mass transit and non-motorized travel and connection to the park</p>	<p>Bailey Road under or overcrossing</p> <p>Easy access from BART</p> <p>Some single use trails</p>	<p>Benches on view points</p> <p>Water fountains</p> <p>Citizen science camera stations</p>	<p>Multi-use</p> <p>Some single use: enough single use trails to allow pro races at times</p>	<p>Good example is Rosie the Riveter visitor center</p> <p>Mass transit connections to area are critical</p> <p>Small train tours in park (like Tilden) – solar or something</p> <p>Strong emphasis on youth and populations that don't usually get outdoors – how to make it appealing to these groups?</p>	<p>Maybe a train section for kids</p> <p>Over or underpass to connect across Bailey Road</p> <p>Trail connections to other open space</p>	<p>Enough different types of trails to allow races (bike, hike, run) without conflicting with other uses</p> <p>Address bunkers</p> <p>Solar panels to power facilities in or out of the park</p>	<p>Critical trail connections between visitor center area and EDC.</p> <p>Train loop from Bailey Road to Visitor Center</p> <p>Prioritize habitat in the South of Bailey Road area. No active recreation into this area but create connections.</p>

GROUP NUMBER	VISION	TRAIL NETWORK			VISITOR CENTER AREA	SOUTH OF BAILEY ROAD	OTHER	MAP NOTES
		TRAIL ALIGNMENTS	AMENITIES	TYPES				
4	<p>Social (navy, town of Port Chicago) and natural history</p> <p>Recreation footprint</p> <p>Camping</p> <p>Supplement the shoreline Port Chicago</p> <p>Important to interpret larger arc of social history, far before the Navy to include Native American, Mexican settlements, town of Bay Point/Port Chicago, eminent domain</p>	<p>Ridge trail</p> <p>Hope some are less steep for different abilities</p>	<p>Trail information at trailhead (UTAP)</p> <p>Non-intrusive cell phone tours</p> <p>Trash cans, poop bags, mutt-mitts</p>	<p>Not keen on mixed-use trails</p> <p>Paved – think accessibility</p>	<p>Social and Natural – full arc of human settlement</p> <p>Naval history</p> <p>Plowshares – into swords – Plowshares</p> <p>Cistern – make history accessible</p> <p>Environmental education</p> <p>Performance spaces</p>	<p>Campground</p> <p>Environmental education</p>	<p>Environmental education</p> <p>Railroad tracks – preserve some</p> <p>Bunkers – rentals?</p> <p>Handcart races</p> <p>Performance spaces</p>	<p>Preserve original Bay Point and Clayton Railroad</p>
5	<p>Preserve all eras of history</p> <p>Preserve open space</p> <p>Trail linkages – city and regional</p> <p>Recreation variety and balance</p> <ul style="list-style-type: none"> • Not all trails multi-use • Dedicated for <ul style="list-style-type: none"> o Hiking only o Biking only <p>Overnight camping – with science buildings?</p>	<p>Continuous trail should be established along the ridge</p> <p>Linkages of trails to developed areas and existing areas: Delta de Anza Trail, Black Diamond, Contra Costa Canal. Also to BART.</p> <p>Possible limited off-leash areas</p>	<p>Benches, natural spots to stop and take a break while hiking, preferable at viewscapes</p> <p>Overnight camping option for groups of youths</p> <p>Bunkers: retain some (possible in concentrated areas) but not all. Remove some single ones</p> <p>Signage: while on the trail, have signs explain historic facts or natural history or geography of area/what you are looking at</p>	<p>Some mixed use, but there is enough space to have some trails dedicated to separate user groups (mountain bikes, etc.) like equestrian, etc. Definitely provide options to separate bikes and hikers.</p>	<p>Building with exhibits - a la Rosie the Riveter</p> <p>Group picnic area</p> <p>Oak tree restoration</p> <p>Concessions</p> <p>Children’s trail – small, easier bike loop</p> <p>Accessible trails</p>	<p>Environmental education – geology, Miwok history, bunkers - interpretive trail to illustrate</p>	<p>Create observatory at Building 97</p> <p>Ridge Trail</p>	
6	<p>Planting of trees</p> <p>Interpretation of history – preservation</p> <p>Recreation – trails, multiuse</p> <p>Name to reflect early inhabitants</p> <p>Open space</p> <p>Wildlife corridor – animal overpass</p>	<p>Identify areas of difficulty</p>	<p>Include ADA, water, restrooms, benches</p> <p>Multiuse trails – areas of freedom for dogs</p> <p>Sheep/cattle leasing</p>	<p>More loop trails</p>	<p>History timeline – educational/interpretive movie</p> <p>Central archline for CCC – library – use other available buildings</p> <p>The area is defined by the explosion and mutiny – need to add human element of what happened to the people of Port Chicago</p> <p>Mock-up of various eras</p>	<p>Picnic areas</p> <p>Campgrounds</p> <p>Ranger station</p> <p>Geological interpretation of natural history</p>	<p>Environmental Living Program (ELP) Educational</p>	

GROUP NUMBER	VISION	TRAIL NETWORK			VISITOR CENTER AREA	SOUTH OF BAILEY ROAD	OTHER	MAP NOTES
		TRAIL ALIGNMENTS	AMENITIES	TYPES				
7	<p>Connected biking and equestrian trails</p> <p>Quiet places</p> <p>Dog friendly</p> <p>Super connected on all sides</p> <p>Camping</p> <p>Picnic</p>	<p>[Connect] with major trails</p> <p>[Rail] tracks to bike trails</p> <p>Along creeks</p>	<p>Bathrooms</p> <p>Water</p> <p>Views</p> <p>Trash receptacles</p> <p>Good camp sites connected to trails</p>	<p>Bike</p> <p>Dog</p> <p>Equestrian</p> <p>ADA (south [of Bailey Road])</p>	<p>Education –history and ecology</p> <p>Super accessible (pedestrian/bike)</p> <p>Aesthetically pleasing</p> <p>Food (good food)</p> <p>Rentable areas (festival, parties)</p> <p>Beyond group sites</p>	<p>Wheel-chair/ADA trail</p>	<p>Functional train for people with limited mobility</p> <p>Wildlife is a priority!</p> <p>Hike-in group camp (scouts)</p>	<p>Trail connections at all major points</p>
8	<p>Open space preservation</p> <p>Resource education</p> <p>Accessibility</p>	<p>Connection of south and north via rail</p> <p>Planned loops</p>	<p>Water?</p> <p>Restrooms</p>	<p>Single-use, where appropriate (for safety) – identify mountain bike trails according to terrain</p> <p>Off leash areas</p>	<p>Education</p> <ul style="list-style-type: none"> • Target young people • Focus on environment and history of the area • Classes/hands-on focused on native species and ecology <p>NOTE: discussion to move visitor center to a different location. If moved, Building 1A-24 complex can be a recreational rental</p>	<p>Less impacted by development</p> <p>Education opportunities (maps, panels)</p> <p>Group camp site</p>	<p>Recycle remainder of rail (leave some for historic preservation) and bunker material (gravel)</p> <p>Sensitivity to existing wildlife</p>	<p>Visitor center located at Bailey Road</p>
9	<p>Accessible open space</p> <p>Areas of cultural or historical/natural importance</p> <p>Safety – users and residents nearby</p> <p>Transit links through park</p>	<p>Good connections to existing trail networks</p>	<p>Trail and interpretive signs</p> <p>Hike-in capacity</p> <p>Overlook benches</p> <p>Trailhead restrooms – pit toilets for campsites</p> <p>Disabled accessible portions</p>	<p>Dedicated single track for pedestrians and bikes</p>	<p>Interactive, education, interpretive</p> <p>History and demise of Port Chicago</p> <p>Transit links – shuttle? Rail tour?</p> <p>Parks office – operations and maintenance</p>	<p>Developed drive-in campsites</p> <p>Regional military memorial for local soldiers fallen</p>	<p>Bunker use:</p> <ul style="list-style-type: none"> • Rent out? • Storage • Conferences • Parties/events 	

GROUP NUMBER	VISION	TRAIL NETWORK			VISITOR CENTER AREA	SOUTH OF BAILEY ROAD	OTHER	MAP NOTES
		TRAIL ALIGNMENTS	AMENITIES	TYPES				
1035	<p>Wildlife preservation and enhancement</p> <p>Historical interpretation</p> <p>Educational components – teaching/learning opportunities – use of outdoors, observation techniques and areas</p> <p>Accessible to all ages and groups, including transportation through park to make it usable by all populations</p> <p>A variety of recreational uses</p>	<p>Trails in steep areas and sensitive habitats should be closed when wet/muddy</p> <p>Preserve ridgelines from Seeno development</p> <p>Connecting these trails to regional trail systems</p> <p>Trails should protect/avoid known sensitive areas</p>	<p>Small markers along trails to explain views and history</p>	<p>Multi-use: bicycling, hiking, walking, running (cross-country challenging), equestrian (for horsepack camping)</p> <p>Network of accessibility – accessible connections</p>	<p>Enhanced opportunities for wildlife viewing – burrowing owls; create seasonal pond and wetlands for CA Tiger Salamander</p> <p>Avoid building/creating permanent contamination areas that can't be cleaned up in the future</p> <p>Vibrant, interactive and comprehensive interpretive center</p> <p>Outreach to City/County school systems</p> <p>Focus on history: human history (racial, social justice, military) and natural history (biological, geological)</p> <p>Opportunities for volunteers, docents, citizen scientists</p> <p>24-7 interpretive opportunities – inside and out</p> <p>Natural history of entire area – Mount Diablo meridian, mapping efforts...</p>	<p>Campground – variety</p> <p>Environmental education center</p> <p>Disc golf course – this will work here!</p>	<p>Railroad buffers – opportunity to use existing tracks and grades</p> <p>Picnic areas scattered throughout the park</p> <p>Keep concessions to a minimum</p> <p>Work with City of Concord to maintain a 250 foot buffer along Mount Diablo Creek.</p>	<p>Create California Tiger Salamander pond and observation area for burrowing owls near Visitor Center Area</p> <p>Protect breeding ponds for California Tiger Salamander near use area South of Bailey Road</p>

1 VISION
 Our vision for the future regional park is...

- OPEN SPACE PRESERVATION
- RESOURCE EDUCATION
- ACCESSIBILITY



2 TRAIL NETWORK
 Annotate the map and answer the questions below.

What are your thoughts about current trail alignments?

- CONNECTION OF SOUTH & NORTH VIA RAIL
- PLANNED LOOPS

What types of amenities should the trails include?

- H₂O?
- RESTROOMS

What types of trails do you envision?

- SINGLE-USE, WHERE APPROPRIATE (A/C SAFETY)
- OFF-LEASH AREAS



3 VISITOR CENTER AREA
 Describe your vision for the visitor center and passive recreation in the area.

- EDUCATION
 - target young people
 - focus on environment & history of area
 - classes/hands-on focused on native species & ecology



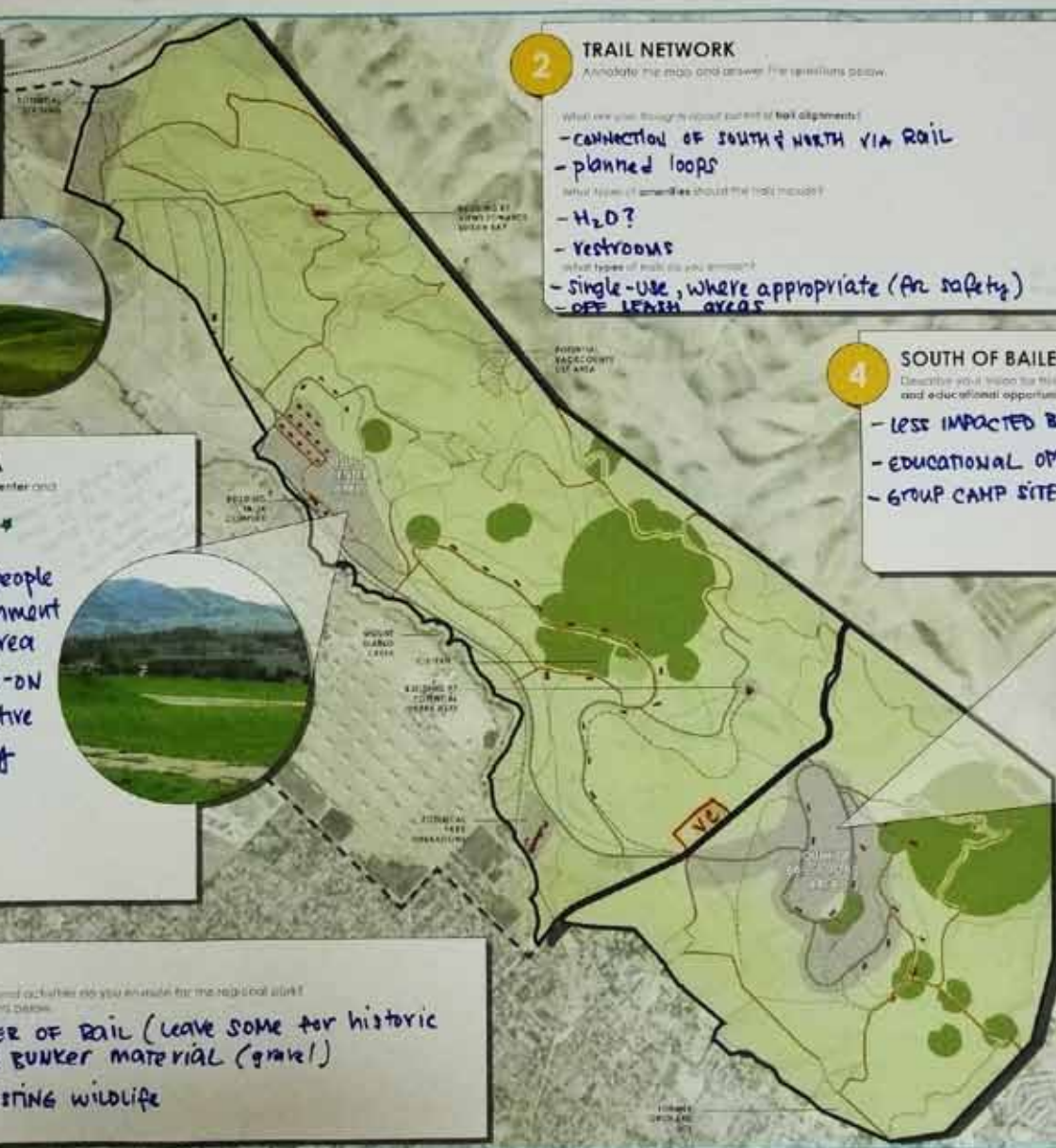
4 SOUTH OF BAILEY ROAD
 Describe your vision for this area. What types of recreational and educational opportunities should be provided here?

- LESS IMPACTED BY DEVELOPMENT
- EDUCATIONAL OPPORTUNITIES (maps, panels)
- GROUP CAMP SITE



5 OTHER
 What other recreational or educational activities do you envision for the regional park? Annotate the map or write comments below.

- RECYCLE REMAINDER OF RAIL (leave some for historic preservation) and BUNKER MATERIAL (gravel)
- SENSITIVITY TO EXISTING WILDLIFE



Blue	Water
Green	Forest
Light Green	Open Space
Dark Green	Wetlands
Grey	Urban
White	Unimproved
Yellow	Highly Sensitive
Orange	Very Sensitive
Red	Extremely Sensitive
Black	Highly Sensitive
Blue	Water
Green	Forest
Light Green	Open Space
Dark Green	Wetlands
Grey	Urban
White	Unimproved
Yellow	Highly Sensitive
Orange	Very Sensitive
Red	Extremely Sensitive
Black	Highly Sensitive

1 VISION

Describe your vision for the future regional park. Annotate the map or write comments below.

- Provide a description of the park's overall vision.
- Describe the park's location, size, and boundaries.
- Describe the park's natural resources and scenic views.
- Describe the park's recreational and educational opportunities.
- Describe the park's infrastructure and facilities.
- Describe the park's management and maintenance plan.



2 TRAIL NETWORK

Annotate the map and answer the questions below.

What are your thoughts about potential trail alignments?

- Describe the trail's location, length, and difficulty.
- Describe the trail's scenic views and natural resources.
- Describe the trail's recreational and educational opportunities.
- Describe the trail's infrastructure and facilities.
- Describe the trail's management and maintenance plan.

What types of trails do you envision?

- Hiking
- Bicycling
- Equestrian
- Cross-country skiing
- Snowshoeing
- Canyoneering
- Mountain biking
- Rollerblading
- Skateboarding
- Inline skating
- Wheelchair accessible
- Service animal accessible
- Adaptive recreation
- Multi-use
- Other




Group 10
 1000 ft
 1000 ft
 1000 ft
 1000 ft
 1000 ft
 1000 ft

3 VISITOR CENTER AREA

Describe your vision for the Visitor Center and passive recreation in the area. Annotate the map or write comments below.

- Describe the Visitor Center's location, size, and design.
- Describe the Visitor Center's recreational and educational opportunities.
- Describe the Visitor Center's infrastructure and facilities.
- Describe the Visitor Center's management and maintenance plan.



4 SOUTH OF BAILEY ROAD

Describe your vision for the area south of Bailey Road. What types of recreational and educational opportunities should be provided here? Annotate the map or write comments below.



5 OTHER

What other recreational or educational activities do you envision for the regional park? Annotate the map or write comments below.

- Describe the activity's location, size, and design.
- Describe the activity's recreational and educational opportunities.
- Describe the activity's infrastructure and facilities.
- Describe the activity's management and maintenance plan.



CONCORD HILLS REGIONAL PARK LAND USE PLAN

WORKSHOP SUMMARY

Public Meeting #2: Design Concepts Review

Concord Senior Center | 2727 Parkside Circle | Concord, CA 94519

November 19, 2015 | 6:30- 8:30pm

EVENT OVERVIEW

Approximately 57 members of the public participated in a workshop to review land use alternatives for the future regional park at the Concord Naval Weapons Station. The workshop included a presentation of the project background and the two alternative land use concepts, followed by a small-group activity.

There were three additional interactive stations that workshop participants could visit during the event, including a map for showing where participants live in relation to the future regional park, a board for listing potential park names, and a board for sharing ideas for magazine re-use. Although not all participants completed these activities, outcomes of the map and magazine reuse stations are provided at the end of this document. No new names were suggested for the future regional park.

SMALL GROUP ACTIVITY

The small group activity focused on refining the alternatives to create a preferred option. Groups were provided large versions of both alternatives, including the site plan and the Visitor Center detail. Each group began by selecting one alternative to use as their base map and was then prompted to annotate the map with changes or additions to the plan. Additionally, the maps include two question boxes to synthesize their ideas:

1. **WHY DID YOUR GROUP CHOOSE THIS ALTERNATIVE?** What features or characteristics are the most important? What do you like most about this alternative?
2. **WHAT WOULD IMPROVE THIS ALTERNATIVE?** Discuss how your group would change the alternative to better meet your visions, and annotate these changes on the map or in the space below. Consider the following:
 - » Roads
 - » Trails
 - » Picnic Areas
 - » Camping
 - » Interpretive Topics
 - » Recreational Uses



Participants were divided into twelve groups when they arrived at the meeting but were merged into six groups for a broader conversation. Summaries of the outcomes from each individual group are included in the following pages. Common themes and topic are included below.

Common Themes/Discussion Topics

Alternative A. Most groups began with Alternative A, and many noted that this was because they preferred the vehicular road pattern shown in this option. Most groups perceived this option to have fewer roads and that the roads that were shown took visitors to the areas that they considered most valuable for recreational use. Many of the groups indicated that although they selected Alternative A, they would like to add some of the trees shown in Alternative B, and all groups made some modifications to the selected Alternative.

Trail Network. Numerous groups indicated that either the level of trail development was adequate or could be expanded. Multiple groups discussed the idea that mode of use would be important to determine so as to avoid conflicts between user groups, specifically bicyclists, equestrians, and hikers. Groups also indicated the need for signage, both within the park and along trail corridors that connect to the future regional park.

Equestrian Facilities. Some groups highlighted the need for equestrian facilities, including larger staging areas for trailers, trail amenities such as troughs and hitching posts, and equestrian-only trails. Groups also considered the existing corrals to be equestrian opportunities that were overlooked.

Picnic Areas. Many groups added additional picnic areas, particularly near the Visitor Center Complex.

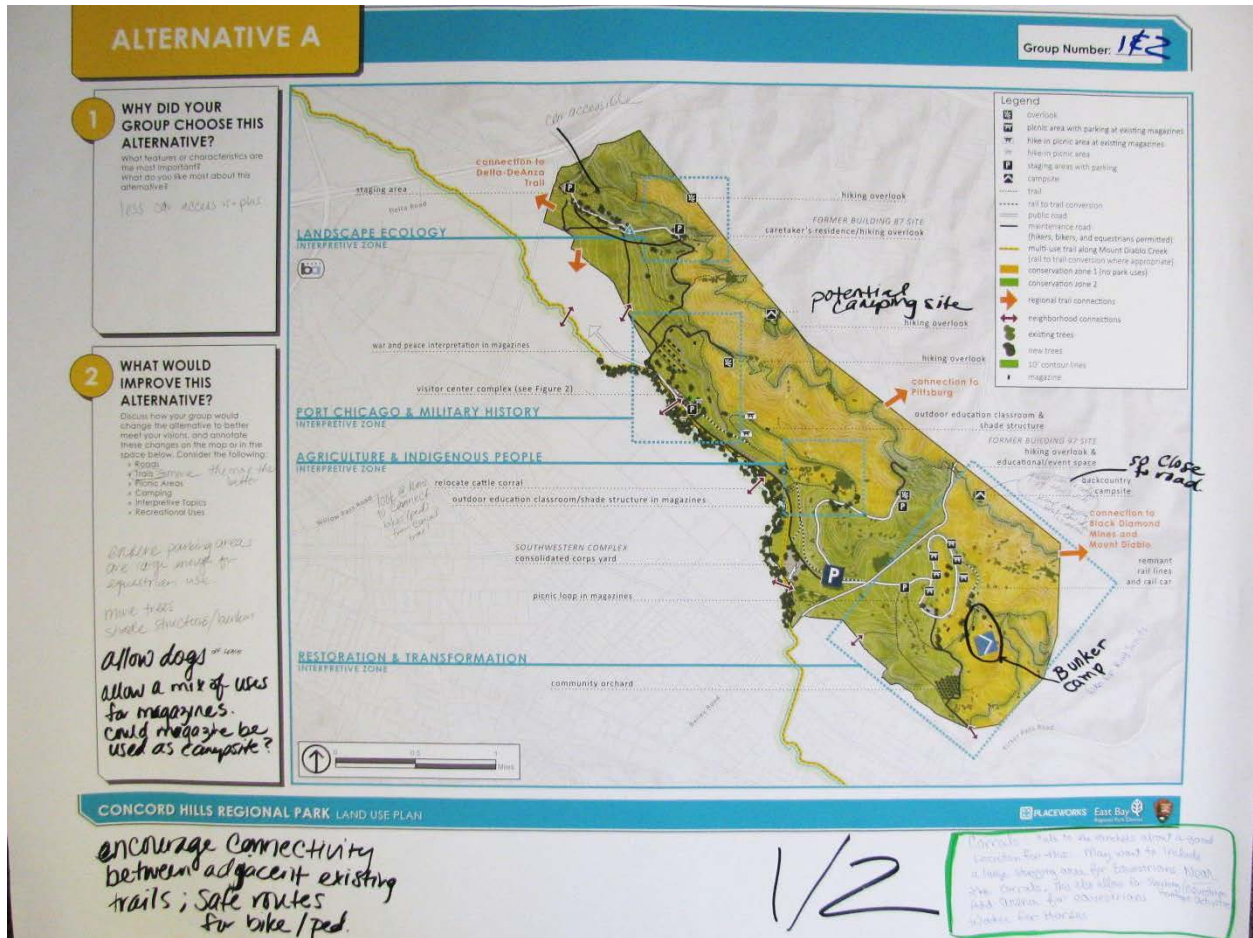
Corral. There were varying opinions about the placement of the corral with some groups pointing out that it is inconsistent with Visitor Center use, some groups considering it a recreational asset in proximity to the Visitor Center, and one group relocating it to another existing corral area.

Community Orchard. Numerous groups highlighted the community orchard as a positive addition to the park with multiple groups expanding infrastructure around the orchard or adding additional community garden-type features.

Camping. Most groups liked the concept of camping on the site and some expanded it to include drive-to sites in addition to hike-in facilities. Groups indicated that the backcountry site should feel like it is in the backcountry.

Habitat Protection. Numerous groups indicated that it was very important to ensure adequate habitat protection, and that habitat should be prioritized over development.





Group 1/2

This group selected **Alternative A** because they considered it to have less car access, which was a plus for the group, and because they felt the ridge trail was very important.

The group modified the site land use plan in the following ways:

Roads

- Changed trail between the staging area on Delta Road and Building 87 to a public road, creating a loop road up to that area.
- Created a new staging area just north of Bailey Road.

Trails

- Emphasized the need to encourage connectivity between adjacent trails and to create safe routes for bikes and pedestrians to the park.
- Indicated that they support lots of trails.

Picnic Areas

- Added additional picnic areas to Visitor Center (see description below)

Camping

- Created a new campsite within the magazines south of Bailey Road, could be hike-in for Boy Scouts.
- Relocated backcountry campsite to the primary area (where it is located in Alternative B) because of concern that it was too close to the road.

Interpretive Topics

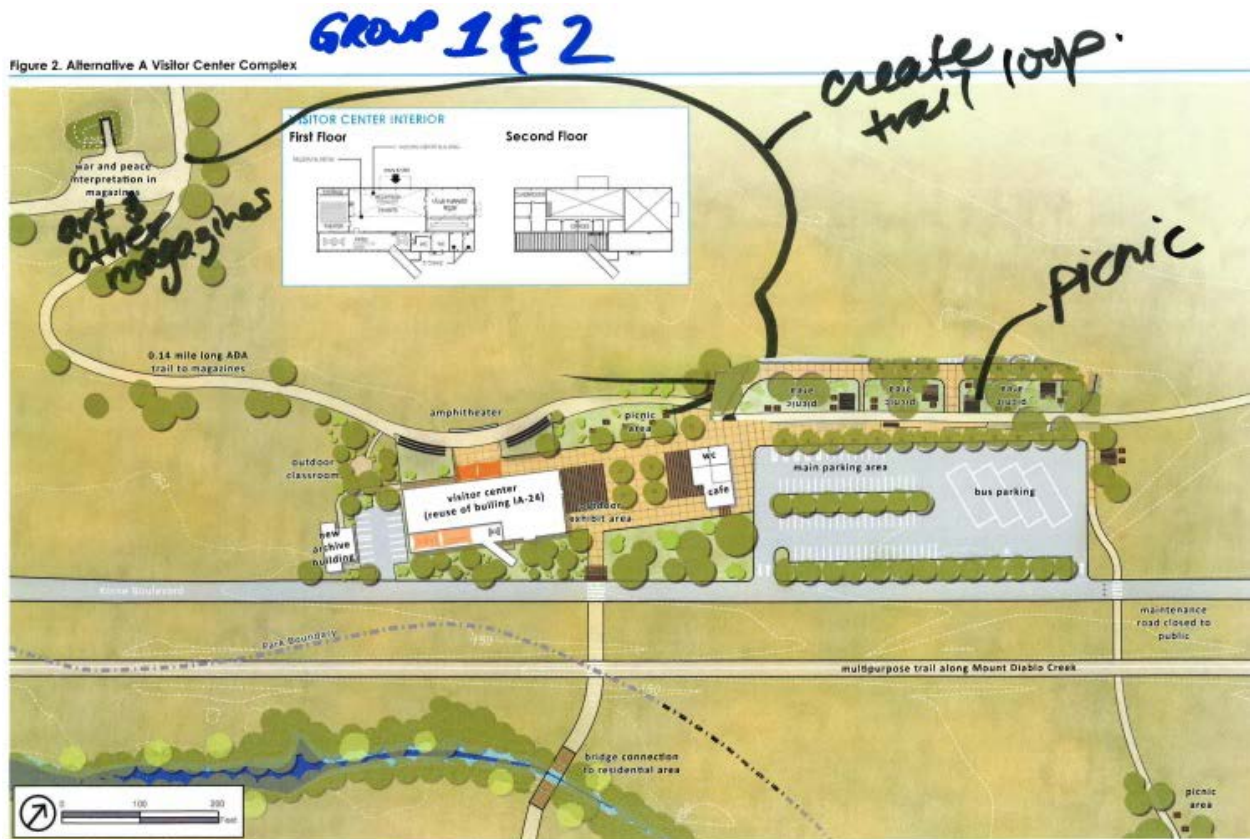
- Suggested utilizing corrals for ranching/equestrian heritage activities – recommended contacting ranchers to receive suggestions on best locations.

Recreational Uses

- Suggested that equestrians might use existing corrals and that the site should consider equestrian needs, including:
 - Staging areas large enough to accommodate horse trailers.
 - Water troughs for horses.
 - Arena.

The group selected **Alternative A Visitor Center Complex** because they did not like the corral being so close to the Visitor Center. The group made the following modifications:

- Added the picnic area from Alternative B.
- Created a loop trail from the picnic area to the magazines.
- Utilized the magazines for art exhibits.





Group 3/4

This group selected **Alternative A** due to the drive-in picnic areas south of Bailey Road and the location of the ridge trail inside the park.

The group modified the site land use plan in the following ways:

Trails

- Suggested re-routing ridge trail to avoid sensitive habitat in the eagle’s nest area, perhaps to the lower road below the ridge.
- Recommended creating an underpass or overpass across Bailey Road to create safe crossing for the ridge trail.
- Addition of trails throughout the site.

Picnic Areas

- Substantially increased picnic capacity at the Visitor Center.

Recreational Uses

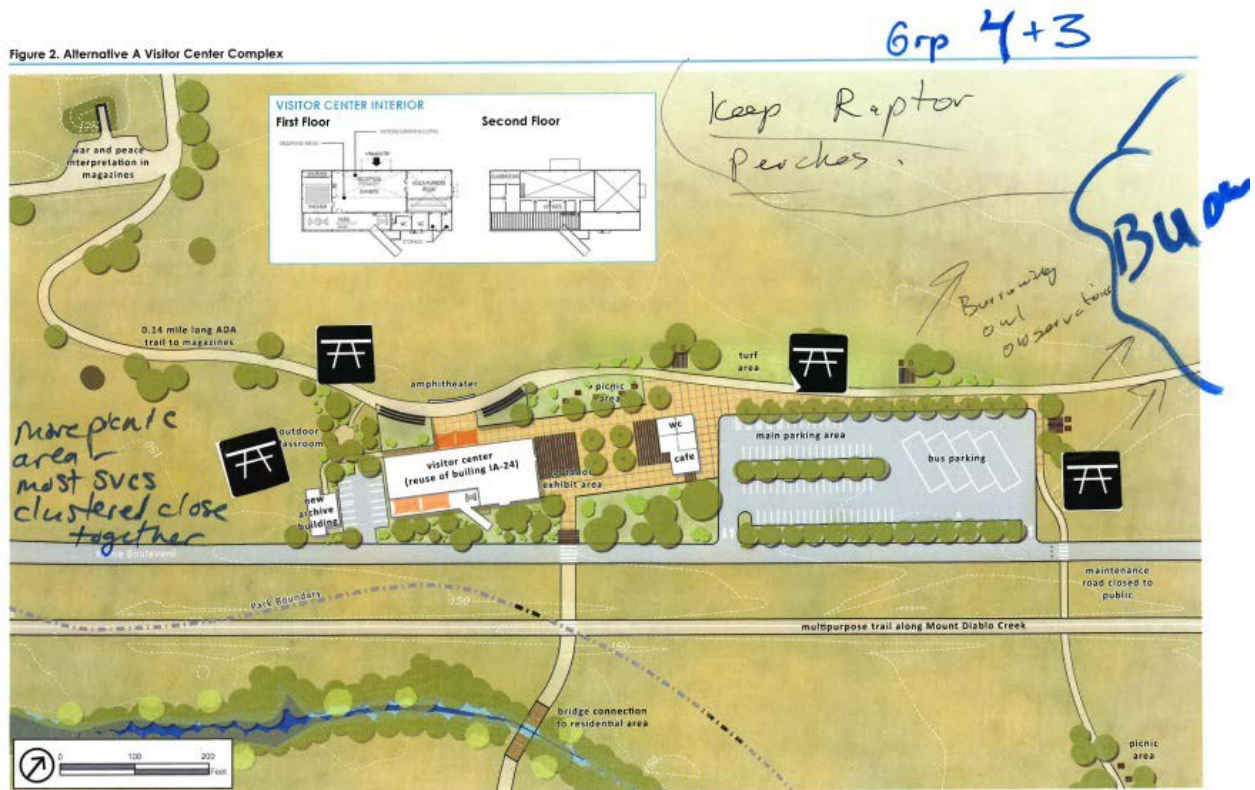
- Moved corral behind the Visitor Center Complex to the other existing corral area northeast of the magazines and suggested that it be used as an active corral to attract tri-colored blackbirds. Also indicated that the corral’s location in Alternative A could hinder burrowing owls in the hillside behind the Visitor Center Complex.
- Emphasized interest in preserving/enhancing community orchard at the historic orchard location.

Other

- Recommended more trees for shade or other shaded facilities, especially around picnic sites, and particularly those near Bailey Road.

The group selected **Alternative A Visitor Center Complex** but made the following modifications:

- Created a burrowing owl observation area that looks out at hillside.
- Suggested keeping raptor perches.
- Added more picnic areas since most services at the park are clustered in this area.





Group 5/6

This group selected **Alternative A** because it felt the alternative was more appropriate for the urban setting, and they preferred fewer trees be added to the site.

The group modified the site land use plan in the following ways:

Camping

- Created additional hike-in campgrounds south of Bailey Road behind the vehicular road.

Other

- Created a shuttle connecting BART to the park.

Recreational Uses

- Desired an equestrian staging area and a corral for public use.

The group selected **Alternative A Visitor Center Complex** but made the following modifications:

- Kept the corral in its existing location (as shown in Alternative B).
- Added bike rental facilities.





Group 7/8

This group selected **Alternative A** due to the use of the rail lines and rail car as a display south of Bailey Road.

The group suggested considerations in the following areas:

Roads

- There was some support in the group for closing area South of Bailey Road to cars. The group indicated that they were split about whether to allow vehicular access.

Trails

- Support having the ridge trail.
- Add a stronger connection to BART.

Recreational Uses

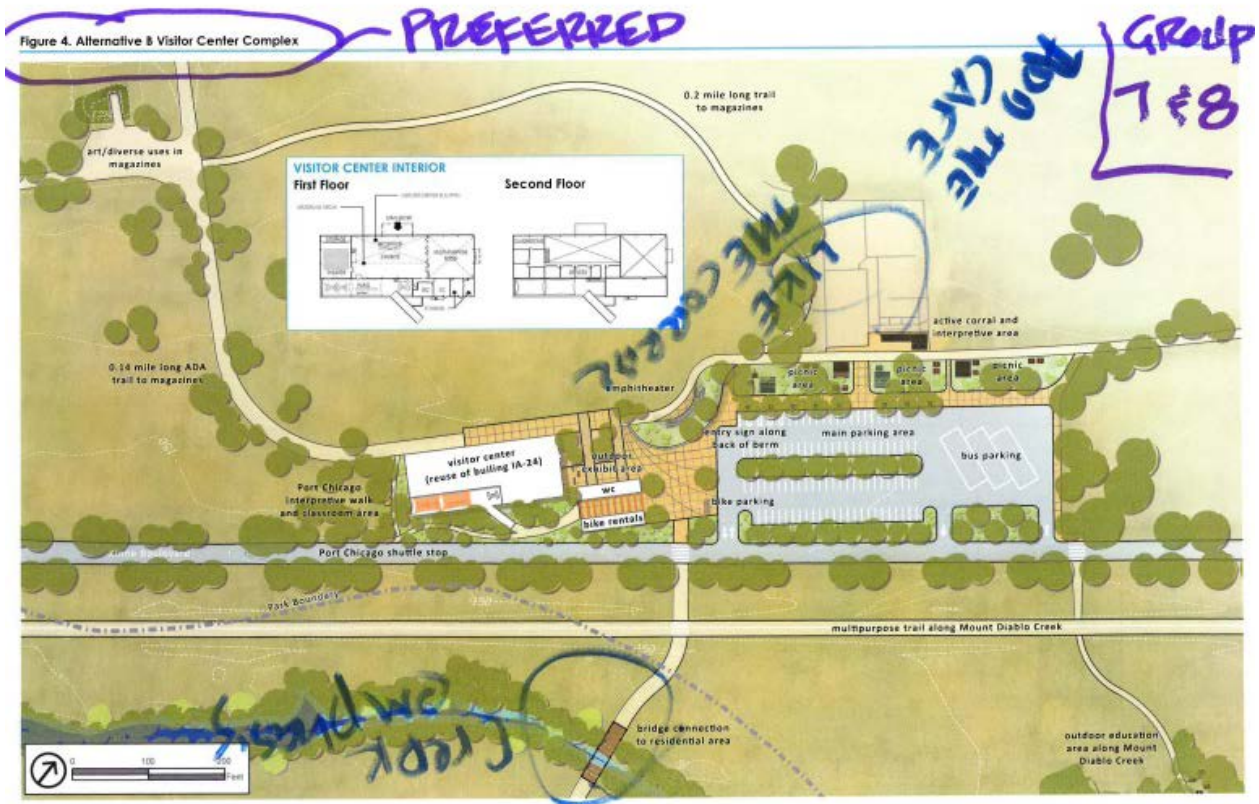
- Would like to see more emphasis on railroad history – would like to keep some of the old line or if converted to trail, keep some of the signage and legacy items, like crossings or memorabilia – particular emphasis on the Bay Point – Clayton Rail line and the multi-layered history of the line.

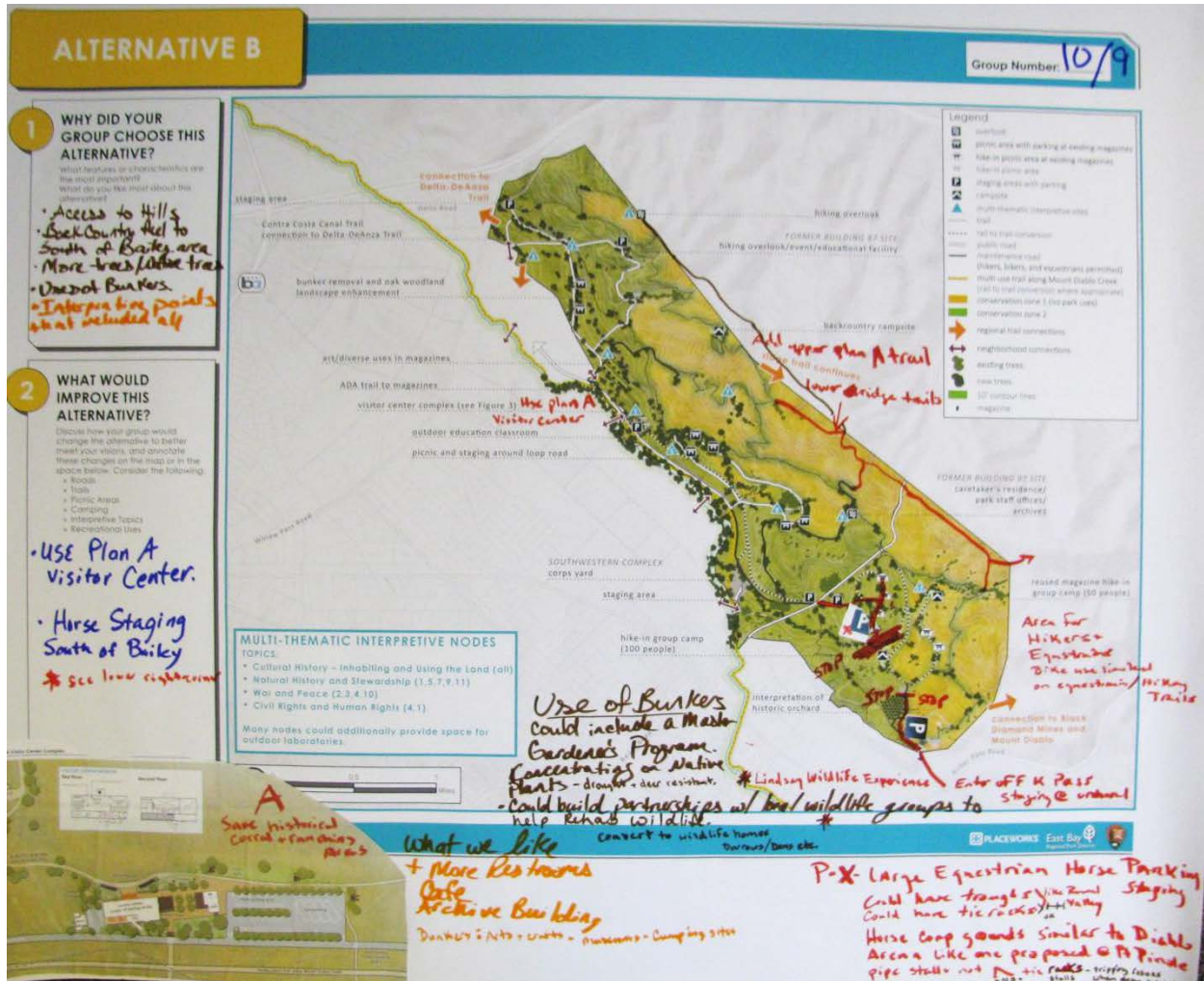
Other

- Some members in the group expressed interest in providing more trees in Conservation Zone 2. The group indicated that they were divided about whether they wanted more trees. The group suggested that there should be more tree planting in the flat area and fewer along the ridge to preserve views.
- Emphasized that the park does not provide any of the same uses as adjacent facilities, such as the proposed City of Concord park the northwest of the site.

The group selected **Alternative B Visitor Center Complex** because they supported utilizing the corral. The group added the following modifications:

- Greater emphasis on Mount Diablo Creek.





Group 9/10

This group selected **Alternative B** due to a preference for vehicular access to the hills and ridge trail. The group also preferred that the area South of Bailey Road had a “backcountry” feel, that there were more trees, that the bunker [magazines] were reused, and that the plan had interpretive points that included all topics.

The group modified the site land use plan in the following ways:

Roads

- Extended vehicular access from the staging area south of Bailey Road to the first row of bunkers and moved the staging area to the end of the road.
- Created vehicular access to the community orchard from Kirker Pass Road with a staging area at the entrance.

Trails

- Added a second trail up in the hills on the Pittsburg side to create a loop along the ridge.
- Continued ridge trail south of Bailey Road.

Camping

- Suggested utilizing magazines near the Visitor Center Complex for camping.

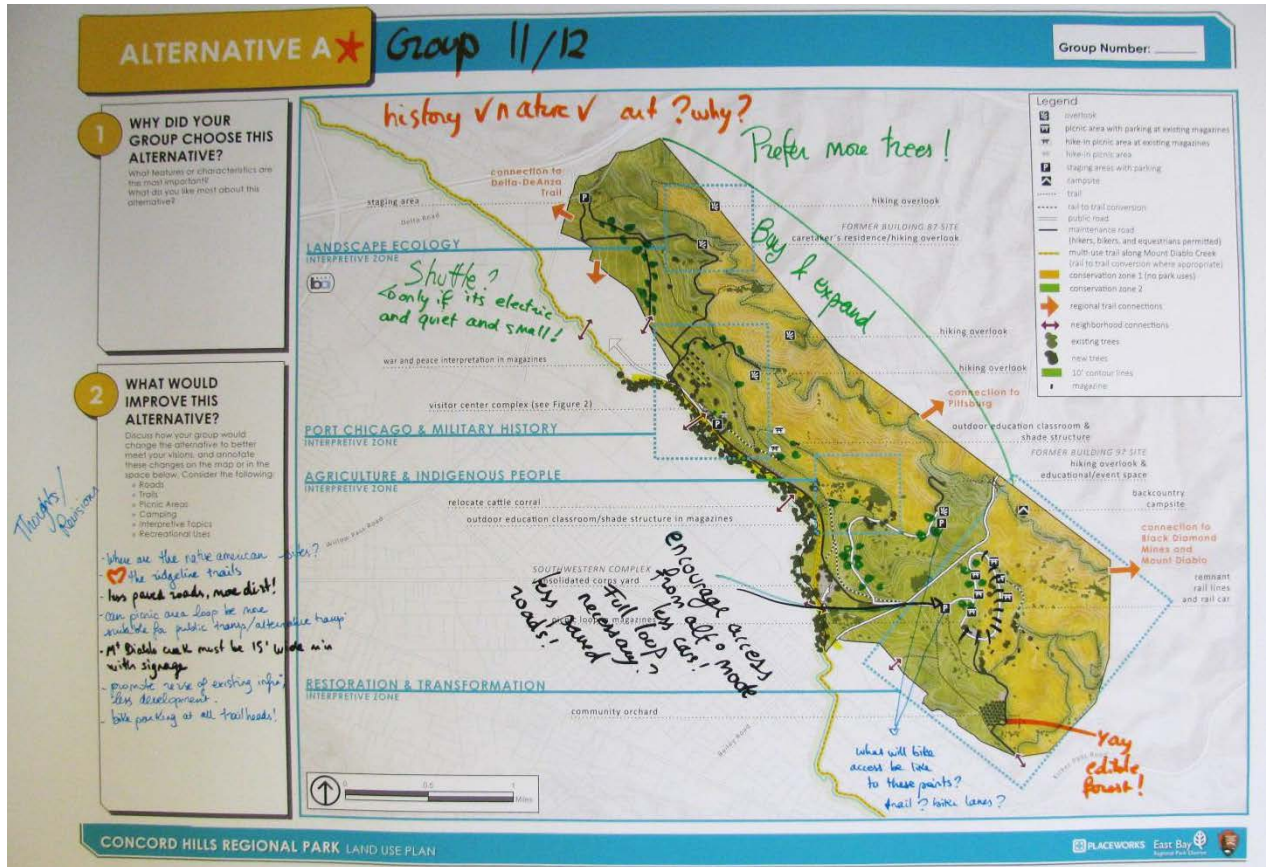
Recreational Uses

- Suggested that the area South of Bailey Road should be used for equestrian and hiking trails with limited bikes to avoid conflict.
- Included expanded equestrian facilities, including:
 - Large equestrian horse parking
 - Troughs and tie racks (like Round Valley Regional Preserve) – although prefer pipe stalls to tie racks because it reduces tripping issues
 - Horse campground (like Mount Diablo State Park)
 - Arena (like the one proposed at Point Pinole)
- Suggested additional uses for magazines near the Visitor Center complex, including:
 - Master gardener program focused on native plants that are drought and deer tolerant
 - Wildlife rehabilitation – could form partnership with wildlife groups – could convert bunker to wildlife homes (dens/burrows)

The group selected **Alternative A Visitor Center Complex** because it had more restrooms, a café, and a separate archive building. The group made the following modifications:

- Kept the corral in its existing location (as shown in Alternative B).
- Added additional uses to the magazines, including: arts and crafts shows, museum exhibits, and camping.
- Added trees (as shown in Alternative B).





Group 11/12

This group selected **Alternative A** because of the ridgeline trail, the community orchard, and the reuse of existing infrastructure. The group indicated a preference for less development and fewer paved roads overall and that the plan should emphasize non-vehicular access. The group also indicated a preference for more trees than presented in Alternative A.

The group suggested considerations in the following areas:

Roads

- Fewer paved roads and more dirt roads or trails.
- Considered whether the public roads are accessible by public transit.

Trails

- Would like to know where bike access is allowed.
- Specified that the multi-use path along Mount Diablo Creek must be at least 15 feet and include directional signage.
- Suggested that there should be bike parking at all trailheads.

Interpretive Topics

- Would like to consider Native American history and important cultural sites.

Recreational Uses

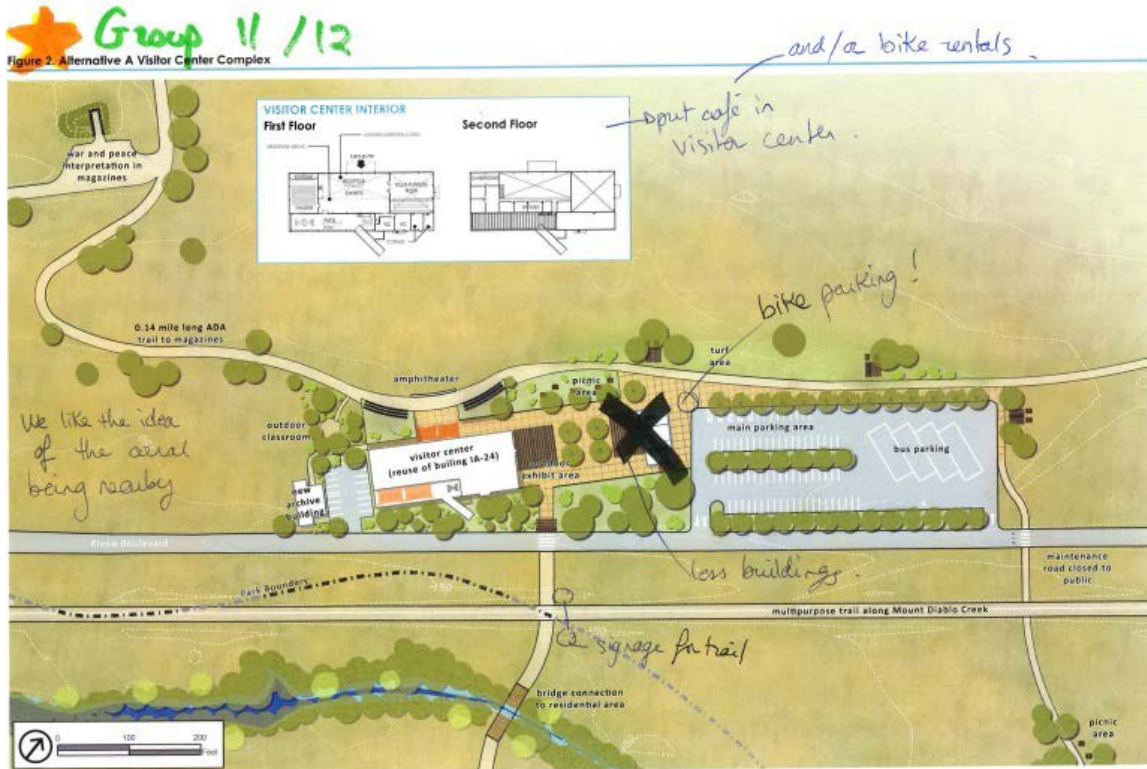
- Supported the community orchard and would support additional edible garden elements.

Other

- Prefer the trees from Alternative B.
- Add a shuttle from BART (electric – small and quiet).

The group selected **Alternative A Visitor Center Complex** but made the following modifications:

- Placed the café inside the Visitor Center and do not create a new building.
- Added bicycle parking.
- Added signage for all trails.
- Considered placing the corral near the Visitor Center complex.

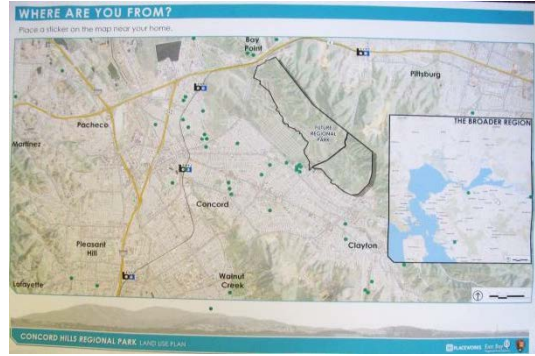


INTERACTIVE STATIONS

Following are outcomes from the interactive stations that workshop participants could provide feedback at throughout the event.

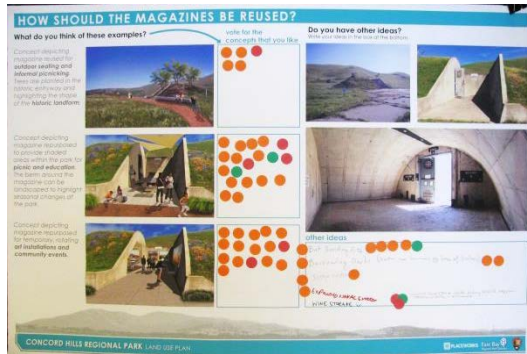
WHERE ARE YOU FROM?

As shown at right, participants came from locations around the Bay Area with the majority coming from Concord or nearby with some participants living directly adjacent to the future park site.



MAGAZINE REUSE

One board showed three alternative uses of existing magazines that could be utilized at the future park site, including a closed magazine that is filled to maintain the historic form; magazines open for picnic space; or magazines open for community events, such as art exhibits. Participants were asked to vote on these concepts or suggest new ideas. Results of this activity are provided below.



Example	Number of Votes
Filled magazine	5
Picnic magazine	19
Event magazine	16
<i>Other:</i>	
Bat roosting habitat	7
Burrowing owl habitat	4
Indoor hostel	3
Expanded naval exhibit	2
Wine storage	1
Campsite	1
Rehabilitating wildlife (partnership with Lindsay Wildlife Experience)	1
Art museums	1

CONCORD HILLS REGIONAL PARK LAND USE PLAN

WORKSHOP SUMMARY

Public Meeting #3: Draft Preferred Alternative Review

Concord Senior Center | 2727 Parkside Circle | Concord, CA 94519

March 24, 2016 | 6:30- 8:30pm

EVENT OVERVIEW

Approximately 34 members of the public and stakeholders participated in a workshop to review the Draft Preferred Alternative for the future regional park at the Concord Naval Weapons Station. The workshop included a presentation of the project background and interactive stations where participants were asked to provide feedback on various elements of the Draft Preferred Alternative, including:

- » Interpretive programming
- » Park Naming
- » Roads, Trails, and Staging Areas
- » Recreational and Educational Facilities
- » Other Comments and Ideas



An overview of next steps for the development of the land use Plan and Environmental Impact Report was also included in the presentation. Questions and comments from the public following the presentation indicated general support and enthusiasm for the Preferred Draft Alternative, as well as concern regarding access to the Visitor Center from Bailey Road and concern that key topics such as Native American history and railroad history be incorporated into the Plan.

All of the stations included a site map and questions that participants were asked to answer directly on the board or by drawing on the map.

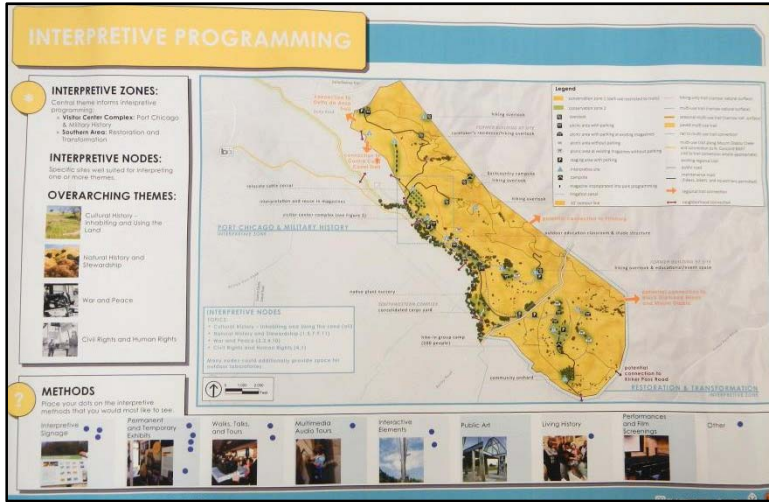
Interpretive Programming

The interpretive programming board outlined the approach to interpretation in the Draft Preferred Alternative, which includes two key interpretive zone areas and multi-thematic interpretive nodes throughout the park. The board additionally outlined the overarching themes presented as part the Draft Preferred Alternative and asked participants to weigh in on these themes, as well as potential methods to engage the public through interactive elements.

Workshop participants voted on their preferred method of interpretation using stickers. As shown in the results above, permanent and temporary exhibits and interpretive signage received the most votes. Workshop participants were also asked to record additional thoughts about interpretation on separate pieces of paper. These included:

- » David & Goliath Story - Port Chicago town story
- » Port Chicago (NPS) visitors often don't know about town - oral history collection
- » Big picture of life pre/post Port Chicago story
- » Oakland Museum examples of good interactive exhibits
- » Can't go home again: the town of Port Chicago
 - o How to compare/contrast with the Black Diamond ghost towns

- » Protests – anti-war, etc.
- » Native people’s history
- » Current descendants [of Native people]
- » Landscapes layered with history (noted as Jerusalem-layers)
- » Railroad history (rail along Diablo Creek identified as important)
- » Interpretation: Use of “Zoo Key” to turn on audio interpretation at key sites (Noted on Recreational and Educational Facilities Board)



Method	Number of Votes
Permanent and Temporary Exhibits	5
Interpretive Signage	3
Walks, Talks and Tours	2
Interactive Elements	2
Multimedia Tours	1
Living History	1
Other	1
Performances and Film Screening	0
Public Art	0

Park Naming

The naming board included a list of names for the park that had been recommended in future workshops and asked participants to vote on those names or to add a new one. Diablo Valley Regional Park was added as a suggestion but was also included as a recommended name from a previous meeting. The naming board also asked participants to suggest names for different features within the park; no names were suggested.



Roads, Trails, and Staging Areas

The roads, trails, and staging areas map asked participants three questions:

1) How would you change the proposed road network?

Participants indicated that they would like to have access to the Visitor Center complex from Bailey Road.

2) How would you change the proposed trail network?

Participants would like to add trail (pedestrian connections) from existing neighborhoods to the north (Mariners/Evora). Participants would also like to maximize ADA access for trails and create longer segments of ADA trails.

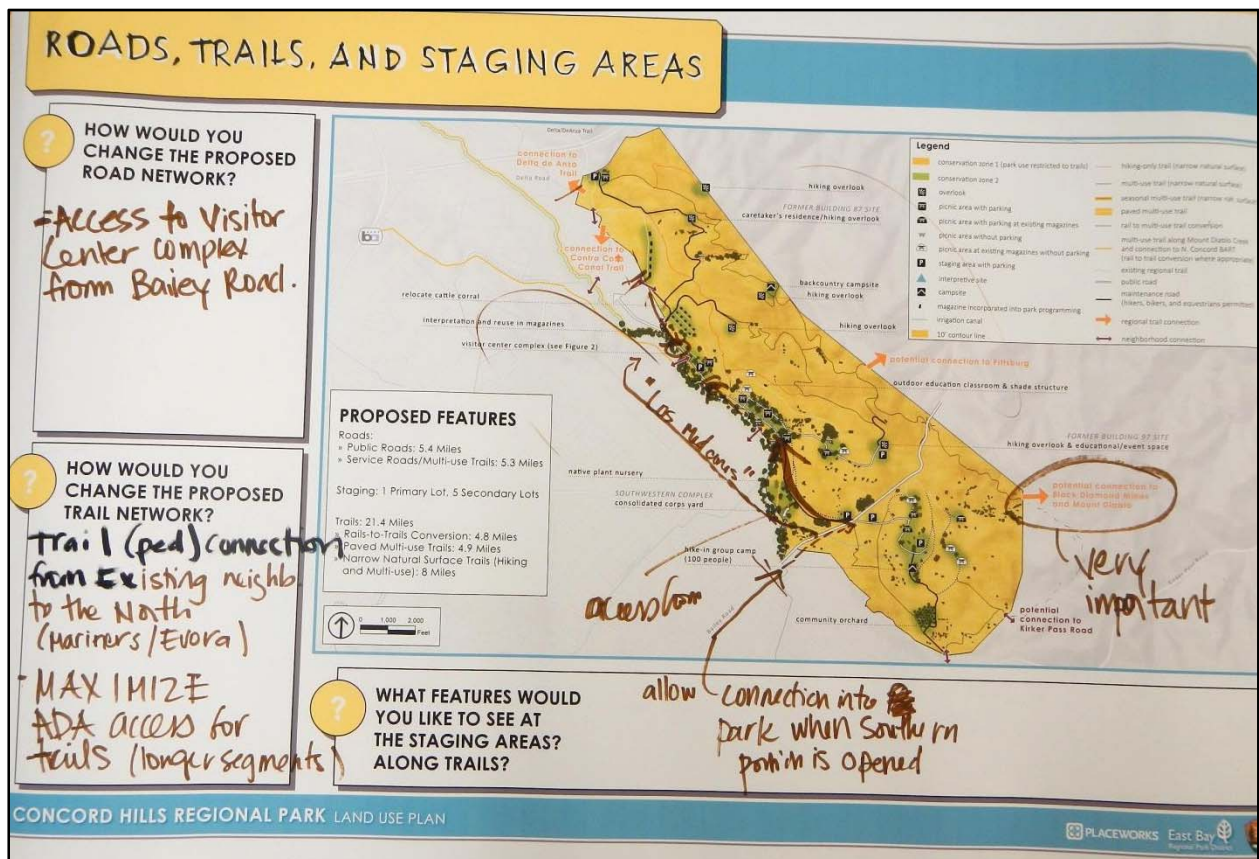
3) What features would you like to see at the staging areas? Along trails?

Participants did not add anything to this section.

Participants additionally marked up the map with notes. These included:

- » Marking the potential connection to Black Diamond Mines and Mount Diablo as very important.
- » Extending vehicular access to Bailey Road.

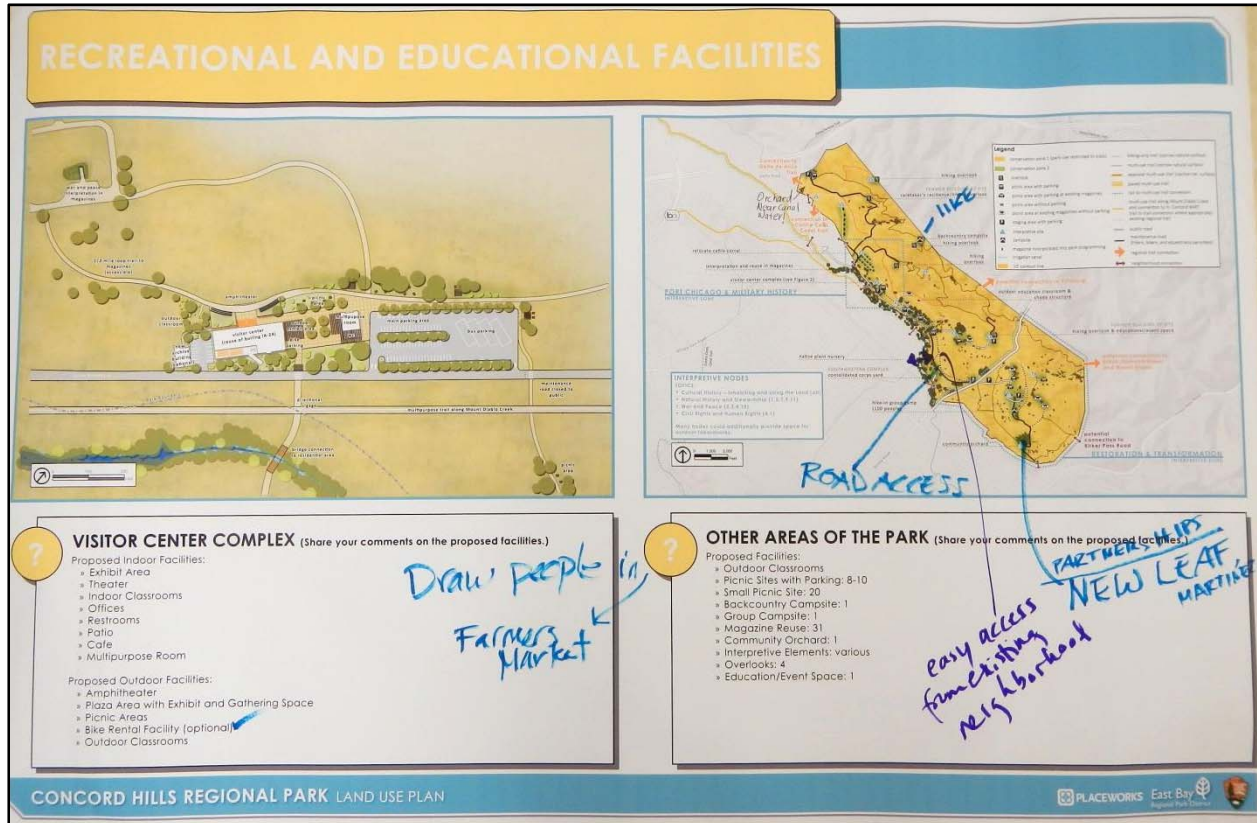
Participants also indicated that it would be helpful to see the park in the context of regional trails and open space and to have more labels for roads on the map.



Recreational and Educational Facilities

The recreational and educational facilities board included a plan for the Visitor Center Complex in addition to the park as a whole, and asked participants to provide feedback on the facilities presented in both plans.

For the Visitor Center Complex, a farmers market was added as a potential facility as a way to draw people into the site. For the full site map, the backcountry campsite was highlighted as being a popular idea. A neighborhood connection point was added near the southwestern complex, and a partnership with New Leaf in Martinez was suggested for the community orchard.



On additional paper, participants added the following items as potential facilities or interpretive elements:

- » Park benches with shade or umbrellas
- » Manual pump or push car for railroad/races

Other Comments and Ideas

The other comments and ideas board asked participants to share any additional thoughts on the Draft Preferred Alternative and prompted ideas within the following categories: habitat protection and enhancement, volunteer programs, operations, and other comments. Participants did not write directly on the board, but added the following items on a separate page:

- » Several people agree – Desire to see Bike/Ped Access from Clayton Canal/E. Concord developed concurrently with park
- » Minimize off-leash dogs & cattle (or designate areas)
- » Room for horse Trailers
- » Maps are hard to orient/add more labels
- » Support for regional trail connections
- » Provide guided walks before park opens (like Save Mount Diablo does)

Concord Hills Regional Park – LUP Scoping Meeting Notes

Thursday June 29, 2017 6:30p.m.

Park Access & Road Network

1. Will the amphitheater be accessible via vehicle?
2. Will homes that align with the park be allowed to create a personal access gate?
3. How will people on Myrtle access the park?
4. Where would the vehicular access points be?
5. Where will be the access on Bailey Road?
6. How long is the stretch of Bailey Road through the park?
7. How does the district plan on managing traffic on Bailey Road?
8. When/where will the Holly Dr. connection be established?

Park Connectivity

1. What will we do about wildlife crossing at on Bailey Road?
2. Are there under crossings for cattle on Bailey Road?
 - a. Will the future crossings be under or over?
3. Suggestion of using existing rail lines for transportation – with trains not just for hiking/walking.
 - a. Community member suggested the District reach out to train aficionados for help
 - b. Niles Canyon Railway may be interested in helping

Park Features & Use

1. What will be in place of the orchard?
2. What will be done with the Eucalyptus and Coulter Pines?
3. What will happen to the 40 bunkers/magazines that are not used?
4. One community member suggested including a water feature or a splash pad.
5. What portion of Diablo Creek is under the purview of the park?
 - a. Are there sensitive species in the creek?
6. What does a caretaker residence entail?
7. Will students be able to conduct resource conservation research in the park?

Maintenance

1. How long will the clean-up of the site take?
2. Will any contaminated land be sealed?
3. Who will manage illegal dumping on Bailey Road?
4. Will there be prescribed burning in the park?
5. What will the District do to ensure the park is maintained secure?

**CONCORD HILLS REGIONAL PARK
LAND USE PLAN | APPENDICES**

**APPENDIX B
ADDITIONAL BACKGROUND
INFORMATION**

APPENDIX B-1

TRANSPORTATION AND CIRCULATION

Transportation and Circulation

Setting

Project Location and Vicinity

The project site includes a portion of the former Concord Naval Weapons Station (CNWS) and is located on the eastern side of the city of Concord in central Contra Costa County. The city of Concord is served by several major highways, including Interstate 680 (I-680), State Route 4 (SR 4), and State Route (SR 242), and an extensive street network made up of arterials, collectors, and local roads. The northwest boundary of the project site runs along the southern side of SR 4, east of its interchange with SR 242 and I-680. Willow Pass Road crosses the site in a northeasterly direction and provides access to SR 4 just north of the site. Bailey Road crosses the southeast portion of the site in a northeasterly direction and then joins SR 4 in western Pittsburg. The North Concord/Martinez BART Station is located to the west of the site, off Port Chicago Highway. Several access roads provide circulation around the site. The regional and local roadways serving the site are shown in **Figure Trans-1** and further described below.

Regional Roadways

I-680 is the primary north-south freeway in central Costa County and runs along the west side of the city of Concord, with an interchange with SR 4 near the northwestern corner of the city. I-680 begins at an interchange with I-80 in Solano County north of Contra Costa County and travels south to its terminus in the city of San Jose. The number of lanes on I-680 within the study area varies from seven lanes north of SR 4 to 12 lanes north of Monument Boulevard.

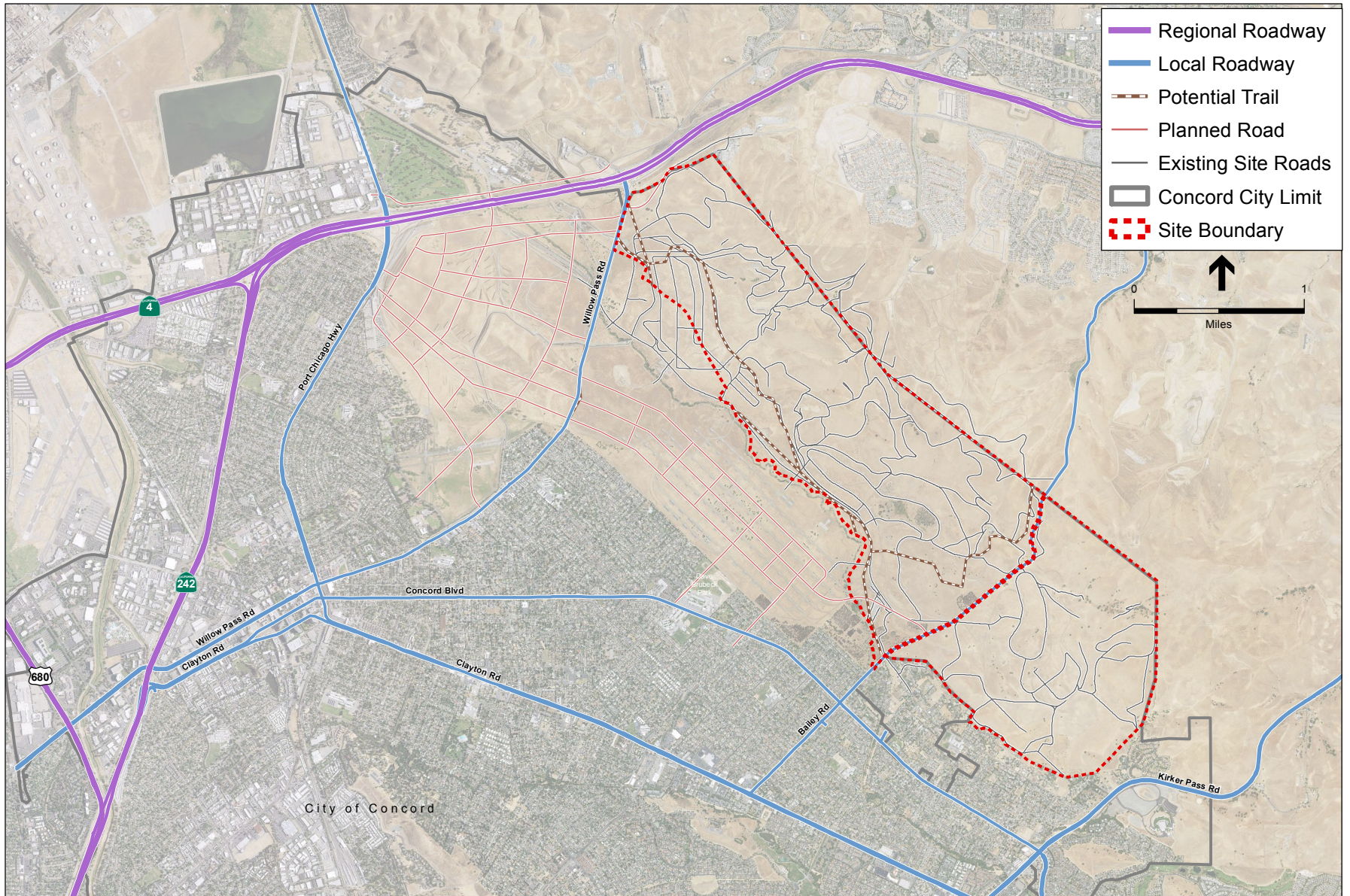
SR 4 is the primary west-east route in northern Contra Costa County. SR 4 begins at the interchange with I-80, near the San Pablo Bay, and runs east through northern Concord to the cities of Pittsburg, Brentwood, Stockton, and eventually reaches its terminus at SR 89 near the California/Nevada state border. SR 4 varies from 12 lanes east of SR 242 to nine lanes east of Willow Pass Road, with direct ramp access near the site provided on Willow Pass Road.

SR 242 is a north-south route that connects SR 4 with I-680, running northeasterly through Concord. SR 242 is a six-lane highway with direct ramp access near the site provided on Olivera Road.

Local Roadways

Willow Pass Road is an arterial that begins at I-680 in Pleasant Hill as a six-lane road, and travels east and then north through Concord as a four-lane and ultimately a two-lane road. Willow Pass Road terminates just north of the project site, where it provides ramp access to SR 4.

Bailey Road is a two-lane arterial that travels in a northeasterly direction from Clayton Road, through the project site, to the city of Pittsburg.



SOURCE: Concord Trails Master Plan, 2002; Concord Community Reuse Plan, 2010

Project . 140660

Figure Trans-1
Existing and Planned Transportation Facilities

Port Chicago Highway is a semi-circular route that begins at Clayton Road as a one-way northbound road in central Concord, and continues north as a two-way road (with four lanes and then two lanes) before turning east and terminating in Bay Point. The road provides ramp access to SR 4 just north of the project site near the North Concord/Martinez BART Station.

Kirker Pass Road/Railroad Avenue/Ygnacio Road is a major corridor extending between I-680 in Walnut Creek and SR 4 in Pittsburg. The roadway does not provide direct access to the former CNWS, but serves as one of the few west-to-east arterials south of the site. The segment south of the property primarily has two lanes in each direction with a center median.

Concord Boulevard is an arterial (with varying width of two and four lanes) to the west of the project site, that begins at the intersection of Clayton Road and Sutter Street, just east of SR 242 near downtown Concord. The roadway continues in a southeastward direction beyond Kirker Pass Road, where it continues as Oakhurst Drive.

Travel Activity in Concord

An analysis of existing traffic conditions on roadway segments, freeway segments, freeway ramps, and intersections in the vicinity of the former CNWS was conducted by Kittleson and Associates in 2013 (U.S. Navy, 2014), updating data used in the Concord Community Reuse Project EIR (City of Concord, 2010). The information presented below is adapted from these studies, which are included as Appendices A and B.

Traffic Volumes

Peak hours for traffic volumes typically occur between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM. Traffic volumes are generally highest during the evening peak hour for the roadway segments studied, except for Bailey Road, which has higher morning peak-hour volumes.

Interstate 680

Morning peak-hour volumes for I-680 (between Monument Boulevard and SR 4) range from about 3,044 to 7,592 vehicles (northbound), and from about 4,867 to 8,592 vehicles (southbound). Evening peak-hour volumes range from about 4,821 to 9,553 vehicles (northbound), and from about 4,075 to 7,286 vehicles (southbound). All of the I-680 freeway ramps in the study area have higher evening peak-hour volumes than morning volumes.

State Route 242

The segment of SR 242 north of I-680 carries about 3,120 northbound vehicles and 4,684 southbound vehicles during the morning peak hour, and 3,015 southbound vehicles and 5,329 northbound vehicles during the evening peak hour. The peak-hour traffic volumes for freeway ramps vary.

State Route 4

Morning peak-hour volumes on SR 4 (between SR 242 and Railroad Avenue) range from about 2,150 to 4,836 vehicles (eastbound) and from about 2,945 to 8,733 vehicles (westbound). Evening peak-hour volumes range from 4,113 to 7,945 (eastbound), and from about 2,208 to 3,359 vehicles (westbound). Westbound peak-hour volumes are generally twice as high during the morning, and eastbound peak-hour volumes are twice as high during the evening. The peak-hour volumes for freeway ramps vary.

Existing Traffic Operations

Evaluation of the capacity of roadway and freeway segments, freeway ramps, and intersections to accommodate current traffic volumes is based on the road facility's Level of Service (LOS). LOS is a qualitative measure that describes the general operating conditions of the roadway or freeway segment, freeway ramp, or intersection using factors such as speed, travel times, and delays. LOS is reported on a scale of "LOS A" to "LOS F," with "LOS A" representing excellent operating conditions with little or no delay, and "LOS F" representing the worst operating conditions with substantial delays. The LOS definitions for intersections and roadways are defined in **Table 1 and 2**, respectively. The LOS standards (minimum acceptable service levels) for intersections, roadway segments, and freeway segments/ramps vary by jurisdiction and by location within jurisdiction. For example, the City of Concord LOS standards are as follows:

- LOS D (outside the Central Business District [CBD], outside 0.5 mile of a BART Station, and not on transit routes serving two or more transit lines)
- LOS E (CBD, within 0.5 mile of a BART Station, or on transit routes serving two or more transit lines)
- LOS F (Congestion Management Program [CMP] Monitoring Intersections operating at LOS F in 1991, and roadway segments connecting to one or more such intersections)
- LOS E (all remaining CMP Monitoring Intersections, and roadway segments connecting to one or more such intersections)

Contra Costa County LOS standards: generally LOS mid-D (volume/capacity ratio 0.85), specifically at Willow Pass Road intersections; LOS E is the standard at Bailey Road intersections.

Contra Costa County Congestion Management Program LOS standards for freeway segments: generally LOS F, except LOS E on northbound I-680 between SR 4 and SR 242, SR 4 between I-680 and SR 242, and northbound SR 242.

Contra Costa County Congestion Management Program LOS standards for freeway ramps: generally LOS D, except LOS F on the following SR 4 ramps (Port Chicago Highway westbound off-ramp, and Willow Pass Road westbound on- and off-ramps).

**TABLE 1
DEFINITIONS FOR INTERSECTION LEVEL OF SERVICE**

Unsignalized Intersections		Level of Service Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

SOURCE: Transportation Research Board, *Highway Capacity Manual*, 2000.

**TABLE 2
DEFINITIONS FOR ROADWAY LEVEL OF SERVICE**

Level of Service Grade	Description
A	Free Flow or Insignificant Delays: The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and by driver preferences. Maneuverability with the traffic stream is good. Minor disruptions to flow are easily absorbed without a change in travel speed.
B	Stable Operation or Minimal Delays: The presence of other vehicles becomes noticeable. Average travel speeds are the same as LOS A, but drivers have slightly less freedom to maneuver within the traffic stream. Minor disruptions are still easily absorbed, although local deterioration in LOS will be more obvious.
C	Stable Operation or Acceptable Delays: The influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles. Minor disruptions can cause serious local deterioration in LOS, and queues will form behind any significant traffic disruption.
D	Approaching Unstable or Tolerable Delays: The ability to maneuver within the traffic stream is severely restricted due to traffic congestion. Travel speed is reduced by the increasing volume. Only minor disruptions can be absorbed without extensive queues forming, and the LOS deteriorating.
E	Unstable Operation or Significant Delays: Operations are at or near capacity, an unstable LOS. The densities vary, depending on the free-flow speed. Vehicles are operating with the minimum spacing for maintaining uniform flow. Disruptions cannot be dissipated readily, often causing queues to form and service to deteriorate to LOS F.
F	Forced or Breakdown Flow with Excessive Delays: This condition occurs when vehicle arrive at a rate greater than the rate at which they are discharged. Operations with queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages.

SOURCE: Transportation Research Board, *Highway Capacity Manual*, 2000.

Intersections: The majority of the intersections included in the analysis operate at or better than the established acceptable LOS standard during morning and evening peak hours (detailed summaries of AM and PM intersection performance are included in Appendices A and B). There are three intersections that operate worse than the above-described acceptable standards, i.e., the intersections of Willow Pass Road and the SR 4 westbound ramps, Willow Pass Road and the SR 4 eastbound ramps, which are both unsignalized and operate at a morning peak-hour LOS E and F, respectively (worse than the County LOS standard). The signalized intersection of Bailey Road and the SR 4 eastbound ramps operates at LOS F during the evening peak hour (worse than the County LOS standard).

Roadway Segments: The roadway segments in the study area generally operate at LOS D or better and are within the above-described established acceptable LOS standard. Exceptions to acceptable service levels are Willow Pass Road (north of Landana Drive) and Bailey Road (east of Concord Boulevard), both of which operate at LOS F during morning and evening peak traffic hours (worse than the County LOS standard).

Freeway Segments: The freeway segments in the project area operate within the above-described LOS standards established for CMP freeways, with the majority of the segments operating at LOS D or better during morning and evening peak hours. Two segments on SR 4 (east of SR 242

and east of San Marco Boulevard) operate at LOS F in the westbound direction during the morning peak hour, but as described, above, however, LOS F is the LOS standard for those CMP freeway segments.

Freeway Ramps: The majority of ramps studied operate within the above-described LOS standards established for CMP freeway ramps, with the majority of the ramps operating at LOS D or better. Three ramps on SR 4 operate at LOS F during the morning peak hour (the westbound off-ramps to Port Chicago Highway and Willow Pass Road, and the westbound on-ramp from Willow Pass Road to SR 4). The LOS on two SR 4 ramps exceed the LOS standard during the evening peak hour (LOS F on the eastbound off-ramp to San Marco Boulevard, and LOS E on the eastbound off-ramp to Willow Pass Road).

Routes of Regional Significance: As described in the Regulatory Setting below, Multimodal Transportation Service Objectives (MTSOs), specifically the travel speed and delay index, are used to evaluate Routes of Regional Significance. None of the area freeways exceed the delay index standard. In addition, SR 4 currently meets the threshold minimum MTSO for High Occupancy Vehicle utilization in eastern Contra Costa County.

Transit

Several public transit options are available in the city of Concord with stops in proximity to the project site. Bay Area Rapid Transit (BART) provides commuter rail service throughout the region. The Pittsburg/Bay Point – SFO/Millbrae line provides a connection between Concord, San Francisco, and the San Francisco International Airport (SFO). The project site is located in proximity to the Concord Station off Oakland Avenue south of downtown Concord, the North Concord/Martinez Station off Port Chicago Highway, and the Pittsburg/Bay Point Station off Bailey Road.

The Central Contra Costa Transit Authority, or County Connection, provides fixed-route and paratransit bus service in Concord and has several routes that provide service near the project site, including routes 10, 15, 17, 28/627, and 93X, and several lines that connect to the three BART stations. Tri Delta Transit provides bus service in east Contra Costa County with routes that connect Concord with the cities of Bay Point, Pittsburg, Antioch, Oakley, Brentwood, and Discovery Bay. Route 201 provides service between the Concord Station and the Pittsburg/Bay Point Station, where transfers can be made to 11 other Tri Delta Transit bus routes. The Concord General Plan indicates additional transit service is planned for the CNWS Reuse Project area that would connect to BART stations and other Concord neighborhoods.

Bicycle and Pedestrian Facilities

Bicycling and walking are considered viable alternatives to the automobile in Concord, and the CNWS Reuse Project promotes pedestrian-oriented design and supporting bicycle facilities. Sidewalks provide access and circulation in key pedestrian activity areas, such as the downtown area and around BART station areas. The City and surrounding jurisdictions typically require the installation of sidewalks for any new development, and as reflected in the Concord Trails Master

Plan (2002), opportunities exist to improve the convenience and safety of existing facilities, and to increase the extent of bicycle and pedestrian facilities throughout the city's developed areas.

Caltrans classifies bicycle facilities into three main categories (Caltrans, 2014):

- **Class I Bike Path** – Provides an exclusive right of way (outside a roadway right of way) for bicycle access
- **Class II Bike Lane** – Provides a striped width on a paved roadway to delineate a width for the preferential use by bicyclists
- **Class III Bike Route** – Shares the road pavement with motorists with bike route signs or markings, but without a designated width for bicyclists.

The City of Concord, in its Trails Master Plan, employs a similar classification for bicycle facilities, but adds two additional subcategories (City of Concord, 2002). Class 3A routes are similar to Caltrans Class III designation routes, while Class 3B routes use edge lanes to provide additional space for bicyclists, but do not meet the 5-foot bike lane minimum width required by Caltrans Class II bike lanes. The Concord General Plan proposes a network of Class I and II bicycle facilities for the redevelopment of the CNWS Reuse Project area.

The City of Concord and Contra Costa County have identified a number of proposed multiuse trails in and around the project area, including additional Class I and Class III trails with off-street and on-street facilities. The Contra Costa Countywide Bike and Pedestrian Plan provides policy and infrastructure recommendations to improve bicycle and pedestrian facilities throughout the region (Contra Costa County, 2009). Contra Costa County has several Class I trails in the study area, including the Contra Costa Canal Trail and the Iron Horse Trail, as well as Class II Bike Lane and Class III Bike Route facilities.

The Concord Trails Master Plan provides a framework for planning trails in Concord with the purpose of promoting the use of trails for recreation as well as an alternative mode of transportation (City of Concord, 2002). The Trails Master Plan includes recommended trail alignments and design guidelines, and identifies several potential trail routes, including a connection to the Delta De Anza Trail and Class I collector trails that follow either rail lines or creeks that run through the site. Potential trail alignments across the project site are shown in Figure Trans-1.

Regulatory Setting

This section identifies the laws, regulations, policies, and programs related to the physical environment that pertain to the project's effects on transportation and circulation on the highways and local roadways within the city of Concord.

Federal

Federal highway standards are administrated in California by Caltrans (see discussion under "State" below).

State

The California Department of Transportation (Caltrans) and the California Transportation Commission (CTC) are the primary agencies that oversee transportation infrastructure in California. Caltrans manages the state's highway and inter-city rail systems, and the CTC is responsible for the programming and allocating of funds for the construction of highway, passenger rail, and transit improvement in the state of California.

California Transportation Plan 2040

Caltrans' California Transportation Plan 2040 (CTP 2040), in Draft form as of March 2, 2015, is a statewide, long-range transportation plan that will create a policy framework for all levels of government to address future mobility needs and reduction of GHG emissions (Caltrans, 2015). Transportation goals identified in the CTP 2040 planning process include improving multi-modal mobility and accessibility for all people and preserving the multi-modal transportation system. Policies related to these goals include operating an efficient transportation system; strategic investment; providing multi-modal choices; sustainable and preventative maintenance strategies; including life cycle costs in decision making; and adapting the transportation system to reduce impacts from climate change. Caltrans District 4 encompasses the nine-county San Francisco Bay Area, including Contra Costa County.

State Transportation Improvement Program and State Highway Operating and Protection Program

The CTC is responsible for adopting the 5-year State Transportation Improvement Program (STIP) and approving the 4-year State Highway Operating and Protection Program (SHOPP). The 2014 STIP includes an estimated \$37.9 million in allocations for state highway improvements, intercity rail, and regional highway and transit improvements in Contra Costa County through 2019. The Interregional Transportation Improvement Program and Regional Transportation Improvement Program (RTIP) nominate projects for inclusion in the STIP. The RTIP is prepared by Caltrans to allocate funding for highway and rail projects that improve interregional mobility across the state. There are multiple STIP and SHOPP projects planned in the project vicinity.

California Transportation Development Act (TDA)

The California TDA provides a dedicated state funding source for use by local jurisdictions at the county level to improve existing public transportation and encourage regional public transportation coordination. Transit agency audits are performed on a triennial basis to ensure that transit agencies are meeting minimum service performance standards. Unmet transit needs identified by local transit agencies and included in the Regional Transportation Plan (RTP). TDA funds can be allocated to non-transit uses if there are no unmet transit needs within the jurisdiction that are reasonable to meet with the use of TDA funds.

Regional

Multiple regional agencies are involved in planning for transportation in and around Concord, and include the Metropolitan Transportation Commission (MTC) of the Bay Area, the Contra Costa Transportation Authority (CCTA), and two Regional Transportation Planning Committees (RTPCs) serving central and eastern Contra Costa County.

Plan Bay Area

The MTC serves as the region's federally designated Metropolitan Planning Organization (MPO) and the state-designated regional transportation planning agency. MPOs are designated in urbanized areas with populations over 50,000 people and are responsible for developing a Regional Transportation Plan (RTP) that recommends regional transportation projects to be included in the STIP. In the Bay Area, the RTP was developed by MTC in partnership with the Association of Bay Area Governments (ABAG), and was integrated with the Sustainable Communities Strategy and adopted in 2013 as Plan Bay Area. Plan Bay Area fulfills the requirements of California's 2008 Senate Bill 375 to reduce GHG emissions from cars and light trucks and plan for future population growth. Plan Bay Area identifies the CNWS Reuse Project area as a Priority Development Area, where the region expects to see transit-oriented and infill development that will accommodate the majority of future growth. As a result, 70 percent of funding through the One Bay Area Grant, which provides a share of the region's federal transportation funding, must be invested in Priority Development Areas for local street preservation, bicycle and pedestrian access improvements, planning activities, and other specific transportation programs.

Congestion Management Program

California's Proposition 111 (1990) specifies that each county designate a congestion management agency to implement programs to manage traffic levels. The CCTA is designated as the congestion-management agency for Contra Costa County and is responsible for coordinating land use, air quality, and transportation planning and for preparing and updating the county's Congestion Management Program (CMP) every two years. The 2013 CMP identifies LOS standards for state highways and principal arterials including I-680, SR 4, SR 242, and sections of Clayton Road, Treat Boulevard, Kirker Pass Road, and Ygnacio Valley Road near the project site. Performance measures are also identified for these key roadways in addition to performance measures for transit service in the County. The CMP also includes a 7-year capital improvement program.

Measure J

In 2004, Contra Costa voters approved Measure J, a law to extend a sales tax under Measure C for an additional 25 years beyond Measure C's 2009 expiration. Measure C was a 0.5-percent transportation sales tax in Contra Costa County passed in 1988, and Measure J continues the half-cent transportation sales tax to fund voter-approved transportation programs and projects and is managed by CCTA. The measure is expected to provide \$2.5 billion for countywide and local transportation projects. As part of Measure J, RTPCs must develop an action plan for Routes of

Regional Significance and establish Multimodal Transportation Service Objectives (MTSOs) for those routes. MTSOs are based on specific criteria and include quantifiable measures of effectiveness for attaining transportation objectives.

Regional Transportation Planning Committees

TRANSPAC (Transportation Partnership and Cooperation) is the designated RTPC in central Costa County, including the city of Concord. The TRANSPLAN committee is the RTPC for eastern Contra Costa County, which includes the area just east of the former CNWS. MTSOs in both eastern Contra Costa County and central Costa County action plans use a delay index for freeways of regional significance. The eastern Contra Costa County action plan MTSO for freeways also includes a utilization of high-occupancy lanes.

Local

City of Concord 2030 General Plan

The City of Concord General Plan (Transportation and Circulation Element), which was amended in 2012 to include the Area Plan for the Concord Reuse Project, includes the following policies regarding transportation resources relevant to the proposed project:

- T-1.1.2: Maintain and upgrade transportation systems to provide smooth flow of traffic, minimize vehicle emissions, and save energy.
- T-1.1.3: Unless otherwise specified, the benchmark for the evaluation of intersections and roadway segments is LOS D. The benchmark is LOS E in the North Concord – Martinez BART Station vicinity
- T-1.1.7: Provide a high level of multimodal connectivity in the design of the citywide transportation system, particularly in the Concord Reuse Project area.
- T-1.1.15: Enhance the visual quality of public space through the design and landscaping of streets, and the control of visual and functional aspects of abutting improvements.
- T-1.3.2: Continue to promote a wide variety of transportation alternatives and modes to serve all residents and businesses to enhance the quality of life.
- T-1.3.3: Ensure that streets are designed to balance the needs of multiple travel modes, including vehicles, pedestrians, bicycles, and transit.
- T-1.4.1 Create a complete street network that provides facilities for all users to travel throughout Concord.
- T-1.4.2 When prioritizing limited funds among potential complete street improvements, focus on the following types of improvements first:
 - Safety: Regardless of location, improvements including sidewalk connectivity projects, that enhance the safety of all roadway users, including drivers, cyclists, pedestrians, and transit users.

- Sidewalk and Bicycle Access to schools, parks, and transit stops: locations often accessed by children and other non-drivers.
 - Reuse Area Access: Tie the Concord Community Reuse Area into the rest of the City
- T-1.4.12 Consider expanding the mandate of the Parks, Recreation and Open Space Commission to include bicycle and pedestrian transportation to ensure that cyclists and pedestrians have an advocate and commission focus within the City.
- T-1.6.1: Coordinate with public transportation agencies to facilitate safe, efficient, and convenient pedestrian access to transit stops; work with agencies to relocate stops when necessary.
- T-1.6.2: Explore the establishment of a local shuttle service to supplement CCCTA and BART service within Concord.
- T-1.6.3: Work with public transportation agencies to provide high-quality, efficient, coordinated transit service that encourages the use of multiple modes of travel, such as cycling to transit stops, and reaches destinations important to transportation-dependent populations such as youth, seniors, and persons with disabilities.
- T-1.6.4: Explore innovative approaches to providing bus and shuttle transit on the Concord Reuse Project site which achieve the service goals established by the CRP Area Plan.
- T-1.7.1: Develop off-street pedestrian linkages, including approaches such as connections allowing pedestrians to travel through the ends of cul-de-sacs, pedestrian paths, bridges over creeks and roadways, and pedestrian underpasses, to minimize walking distance and enhance pedestrian circulation throughout the City; consider planned development on the CRP site when establishing such linkages
- T-1.7.4: Prioritize pedestrian connections from new development to nearby open spaces and trails.
- T-1.8.1: Implement strategies and actions for enhanced bicycle circulation throughout the City.
- T-1.8.4: Require provision of bicycle facilities in new developments, where appropriate.
- T-1.8.5: Encourage, and where appropriate require, new development to provide bicycle access to parks, schools, and transit stops in the design of new residential neighborhoods.

Concord Reuse Project Area Plan

The Concord City Council adopted the Concord Reuse Project Area Plan in January 2012 (and incorporated it by reference in the Concord General Plan), and Chapter 2 of Book Two (Technical Chapters) sets forth the following policies regarding transportation resources relevant to the proposed project:

- T-1.1: Provide road connections between the Planning Area and surrounding neighborhoods as shown on the Area Plan diagram.

- T-1.2: Provide bicycle and pedestrian connections within Greenways shown on the Area Plan Diagram and in other locations where feasible to link the bicycle and pedestrian network in surrounding neighborhoods to the neighborhoods, workplaces, and commercial and recreational amenities in the Planning Area.
- T-1.3: In portions of development districts with significant topography, provide pedestrian connections at grades of 5% or less along public rights of way (e.g., streets and pedestrian paths) to enable comfortable access to key destinations such as the North Concord / Martinez BART station and other portions of the site.
- T-1.4: Design public rights-of-way to help ensure personal safety through the use of techniques such as pedestrian-scale lighting, frequent ground floor windows facing sidewalks and pedestrian paths, and other techniques with demonstrated personal safety benefits.
- T-1.5: Provide for the safety of bicyclists and pedestrians through low-speed streets, properly sized bike lanes, continuous sidewalks, and crosswalks; and by implementing traffic controls which reduce conflicts with motor vehicles.
- T-1.6: Develop funding agreements with local transit operators, or require private operators, to provide frequent bus service between mixed-use districts, Village Centers, and commercial districts and to connect the CRP area to surrounding neighborhoods.
- T-1.7: Create a circulation system that provides easy connections from BART to bus and from both BART and bus to car-share, pedestrian and bicycle facilities that provide access to destinations throughout the CRP area.
- T-1.9: Promote bicycling, walking, and transit use through public information and education relating to facilities, services, safety, schedules, environmental benefits, and related topics.
- T-1.10: Require that project proponents present a plan for funding transit service consistent with the standards in the CRP Area Plan.

In addition, Section 3.2.2.1 of Book Three (Vehicle Miles Travelled Reduction Principles and Policies) cites the following transportation-related policies relevant to the proposed project:

- CA-T-2.1: Provide bicycle and pedestrian connections within Greenways shown on the Area Plan Diagram and in other locations where feasible to link the bicycle and pedestrian network in surrounding neighborhoods to the neighborhoods, workplaces, and commercial and recreational amenities in the Planning Area. (*See Book Two, Policy T-1.2*)
- CA-T-2.2: In portions of development districts with significant topography, provide pedestrian connections at grades of 5% or less along public rights of way (e.g., streets and pedestrian paths) to enable comfortable access to key destinations such as the North Concord / Martinez BART station and other portions of the site. (*See Book Two, Policy T-1.3*)
- CA-T-2.3: Design public rights-of-way to help ensure personal safety through the use of techniques such as pedestrian-scale lighting, frequent ground floor windows facing

sidewalks and pedestrian paths, and other techniques with demonstrated personal safety benefits. *(See Book Two, Policy T-1.4)*

CA-T-2.4: Provide for the safety of bicyclists and pedestrians through low-speed streets, properly sized bike lanes, continuous sidewalks, and crosswalks; and by implementing traffic controls which reduce conflicts with motor vehicles. *(See Book Two, Policy T-1.5)*

CA-T-2.5: Develop funding agreements with local transit operators, or require private operators, to provide frequent bus service between mixed-use districts, Village Centers, and commercial districts and to connect the CRP area to surrounding neighborhoods. *(See Book Two, Policy T-1.6)*

CA-T-2.6: Create a circulation system that provides easy connections from BART to bus and from both BART and bus to car-share, pedestrian and bicycle facilities that provide access to destinations throughout the CRP area. *(See Book Two, Policy T-1.7)*

City of Concord Development Code (Chapter 18)

The City of Concord Municipal Code Chapter 18 (also called the Development Code) includes ordinances designed for transportation resources. Chapter 18.160 Parking, Loading, and Access provides standards for requirements related to vehicle parking for different land uses, site access considerations, bicycle parking, etc. to ensure that adequate parking facilities and access are provided for new development and uses, and for alterations and expansion of existing uses. That chapter's purpose also in to provide safe and orderly access, circulation and parking, and to minimize conflicts between pedestrian and vehicular circulation.

Recommendations

- While several of the local and regional roadways in the project vicinity are at or near capacity during weekday AM and PM peak hours, it is worth noting that park developments typically do not generate many new trips during weekday peak hours. Conversely, roadway traffic conditions on weekends, when park developments typically generate most of their new trips, typically are better (less traffic) than during weekday peak hours. As such, depending upon the types of developments proposed, roadway performance may not be a planning constraint.
- The Land Use Plan should evaluate opportunities to connect with existing and planned regional trail, pedestrian, and transit connections.
- East Bay Regional Park District should work with local and regional transit service providers to coordinate planning of park improvements with expansion and augmentation of local and regional transit service.

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APPENDIX B-2

CULTURAL RESOURCES

Cultural Resources

This section documents the existing conditions of the Concord Hills Regional Land Use Plan (LUP) area and discusses cultural resources, including historic-era resources of the built environment and archaeological resources. The information presented in this section has been adapted from two comprehensive studies completed for the Concord Naval Weapons Station (CNWS) Base Realignment and Closure (BRAC). JRP (2009) prepared an inventory and evaluation of the built environment (including buildings, structures, bridges, railroads, water-conveyance systems, etc.) in the *Historic Building Inventory and Evaluation Concord Naval Weapons Station Contra Costa County, California*. ASM Affiliates (Garcia-Herbst and Hale, 2008) documented archaeological resources (both historic-era and prehistoric) in the *Final Report for Concord Inland BRAC Disposal Archeological Survey, Naval Weapons Stations, Seal Beach, Detachment Concord, Contra Costa County California*.

Definitions

Architectural and Structural Resources

Architectural and structural resources are typically elements of the built environment, including but not limited to buildings, structures, objects, and districts. Buildings range from single-family residences, stores, schools, and factories to downtown commercial districts, ranches, and military bases. The term “structure” is used to create distinction between infrastructure and facilities, such as roads, railroads, trails, bridges, dams, canals, ditches, retaining walls, tunnels, gardens, and statues, and buildings made for purposes other than human shelter such as barns, sheds, or workshops. A structure that has lost its historical configuration or pattern of organization through deterioration or demolition (e.g., bridge footings, foundations) is usually considered a ruin and categorized as an archaeological site.

Archaeological Resources

An archaeological site is defined as “the location of a significant event, a prehistoric or historic-era occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure” (NPS, 1990). Prehistoric archaeological materials might include obsidian and chert flaked stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, adobe, or wooden footings, foundations, and walls; artifact-filled wells or privies, and sheet refuse; or deposits of metal, glass, and/or ceramic refuse. Faunal and floral remnants can be associated with both prehistoric and historic-era sites. Human remains can be associated with archaeological sites or found in an isolated context.

Setting

Natural Setting

The LUP area is in the Mt. Diablo Creek drainage system along a south-north sloping valley. Hills on the east of the valley rise over 600 feet above sea level, reaching a maximum elevation of approximately 1,000 feet in the south. The area is within the Bay Area-Delta bioregion, which consists of a variety of natural communities that range from the open waters of the Suisun Bay and Delta to salt and brackish marshes to chaparral and oak woodlands. The temperate climate is Mediterranean in nature, with relatively mild, wet winters and warm, dry summers. Habitat types include annual (non-native) grasslands, coastal scrub, Eucalyptus woodland, riparian corridors, emergent wetlands, and ruderal communities. A wide variety of migratory and year-round resident birds use the bay and associated creeks and marshes as habitat for nesting and feeding. Salmonid and other fish were historically present in local creeks, and Mt. Diablo Creek is still identified as an important fish habitat.

The San Francisco Bay Area has undergone dramatic landscape changes since humans began to inhabit the region more than 13,000 years ago. Sea levels began rising about 15,000 years ago, at which time the coastline was located west of the Farallon Islands, and reached the present level of the bay about 5,000 years ago. This dramatic change in stream base-level has resulted in increased deposition of sediment along the lower reaches of streams and bays (Helley et al., 1979). Gold Rush-era sedimentation has exacerbated this deposition over alluvial fans and within the bay and delta. Active alluvial fan¹ deposits are generally less than 5,000 years old and overlie older land surfaces (including stabilized and abandoned Pleistocene-age alluvial fans).

In many places, the interface between older land surfaces and active alluvial fans is marked by a well-developed buried soil profile, or a paleosol². Paleosols preserve the composition and character of the earth's surface prior to subsequent sediment deposition; thus, paleosols have the potential to preserve archaeological resources if the area was occupied or settled by humans (Meyer and Rosenthal, 2007). Because human populations have grown since the arrival of the area's first inhabitants, younger paleosols (late Holocene) are more likely to yield archaeological resources than older paleosols (early Holocene or Pleistocene).

The geology of the LUP area consists of Eocene-age sedimentary rocks on the upland hillsides and Holocene-age alluvial sediments on the valley floor (Witter et al., 2006). The Holocene-age alluvial sediment has a high potential to contain paleosols and buried archaeological resources, especially near to the meandering alignment of Mt. Diablo creek. Numerous archaeological sites have been found in this context in the greater Bay Area; no buried sites have been previously documented in the LUP area, the vicinity of Mt. Diablo Creek, or the broader city of Concord.

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- ¹ Alluvial fans are fan-shaped deposits of water-transported material (alluvium). They typically form at the base of topographic features where there is a marked break in slope, and contain both active and abandoned stream channels, terraces, natural levees and other fluvial morphologies.
 - ² A paleosol is a buried soil that forms when sediment is deposited over a surface with a developed soil profile without it being eroded away first.

Prehistoric Context

Categorizing the prehistoric period into cultural stages allows researchers to describe a range of archaeological resources with similar cultural patterns and components during a given time frame, creating a regional chronology. This section provides a brief discussion of the prehistoric chronology for the LUP area.

The natural marshland communities along the edges of bays and channels were the principal source for subsistence and other activities during the prehistory of the San Francisco Bay region. Many of the original surveys of archaeological sites in the Bay region were conducted between 1906 and 1908 by Stanford (and, later, U.C. Berkeley) archaeologist N. C. Nelson. Such surveys yielded the initial documentation of nearly 425 “earth mounds and shell heaps” along the littoral zone of the bay (Nelson, 1909). From these beginnings, the most notable sites in the region were excavated scientifically, such as the Emeryville shellmound (CA-ALA-309), the Ellis Landing Site (CA-CCO-295) in Richmond, and the Fernandez Site (CA-CCO-259) in Rodeo Valley (Moratto, 1984). These dense midden sites, such as CA-ALA-309, have been dated to be $2,310 \pm 220$ years old, but other evidence suggests that human occupation in the region is of greater antiquity, perhaps as early as 7000 B.C. (Davis & Treganza, 1959, as cited in Moratto, 1984).

Milliken et al. (2007) has provided a framework for the interpretation of the San Francisco Bay Area and divided human history into four periods: the *Paleoindian Period* (11,500–8000 B.C.), the *Early Period* (8000–500 B.C.), the *Middle Period* (500 B.C.–A.D. 1050), and the *Late Period* (A.D. 1050–1550). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The *Paleoindian Period* (11,500–8000 B.C.) was characterized by big-game hunters occupying large geographic areas. Evidence of human habitation during the *Paleoindian Period* has not yet been discovered in the San Francisco Bay Area. During the *Early Holocene (Lower Archaic, 8000–3500 B.C.)*, geographic mobility continued from the *Paleoindian Period* and is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are first documented in burials during the *Early Period (Middle Archaic, 3500–500 B.C.)*, indicating the beginning of a shift to sedentism. During the *Middle Period*, which includes the *Lower Middle Period (Initial Upper Archaic, 500 B.C.–A.D. 430)*, and *Upper Middle Period (Late Upper Archaic, A.D. 430–1050)*, geographic mobility may have continued, although groups began to establish longer term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian, and chert concave-base projectile points, as well as the occurrence of sites in a wider range of environments, suggest that the economic base was more diverse. By the *Upper Middle Period*, mobility was being replaced by the development of numerous small villages. Around A.D. 430, a “dramatic cultural disruption” occurred as evidenced by the sudden collapse of the *Olivella* saucer bead trade network. During the *Initial Late Period (Lower Emergent, A.D. 1050–1550)*, social complexity developed toward lifeways of large, central villages with resident political leaders and specialized

activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

Ethnographic Background

Based on a compilation of ethnographic, historic, and archaeological data, Milliken (1995) describes a group known as the Bay Miwok, who once occupied the general vicinity of the LUP area. Bay Miwok territory extended from East Contra Costa County eastward to the Sacramento–San Joaquin Delta. Miwok refers to the entire language family that was spoken by the Bay Miwok, as well as Coast, Lake, Valley, and Sierra Miwok. Along with the Ohlone peoples of the San Francisco Bay Area, the Miwok are members of the Utian language family. While traditional anthropological literature portrayed the Miwok peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between villages. While these “static” descriptions of separations between native cultures of California make it an easier task for ethnographers to describe past behaviors, this masks Native adaptability and self-identity. California’s Native Americans never saw themselves as members of larger “cultural groups,” as described by anthropologists. Instead, they saw themselves as members of specific villages, perhaps related to others by marriage or kinship ties, but viewing the village as the primary identifier of their origins.

The *Chupcan*, a subgroup of the Bay Miwok, consisted of 300 to 400 people who inhabited the lower Diablo Valley, including the LUP area and the areas of the present cities of Concord, Clayton, and Walnut Creek (Milliken, 1995). Each large village had a tribal leader but there does not appear to have been a defined larger organization (Kroeber, 1925; Levy, 1978). The settlement pattern included permanent villages in valleys, along rivers or other waterways, organized as districts of smaller settlements or ‘tribelets’ around “one larger and continuously inhabited town, the center of a community with some sense of political unity” (Kroeber, 1925: 218). Economically, the *Chupcan* engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. Marshlands were utilized for resource procurement, including the collection of fish, shellfish, plants, and sea mammals. The *Chupcan* built two types of dwellings including semi-subterranean pit houses used in the winter months and pole-framed houses thatched with tule or other brushy plants (Levy, 1978).

By the mid-1800s Spanish missionization, diseases, raids by Mexican slave traders, and dense immigrant settlement had disrupted Miwok culture, dramatically reducing the population, and displacing the native people from their villages and land-based resources. There are no present-day Native Americans that trace their ancestry to the *Chupcan* people. Descendants of other Bay Miwok groups and adjacent Patwin and Ohlone groups, who resided at the Missions San Francisco and San José during the Spanish period, are the closest genetic relatives (Rosenthal et al., 2000).

Historical Overview

The information presented in this section has been adapted from the summarized historic context developed by JRP (2009) during the inventory and evaluation of the historic built environment for the Inland Area of the Concord Naval Weapons Station, which includes the LUP area.

Spanish, Mexican, and Early American Periods

The earliest documented uses of the land that comprises the LUP area revolved around the agricultural operations of Spanish, Mexican, and early American settlers. The Mexican land grants of Rancho Los Medanos and Rancho Monte Del Diablo, both granted in the 1830s, occupied the variable swath of mountains, plains, and coastline extending between the contemporary areas of Pittsburg and Antioch to Pacheco. Orchards, cattle ranching, and sheep grazing dominated the landscape until the middle of the nineteenth century, when the discovery of coal on the slopes of Mount Diablo brought an influx of mining activity, increased population, and greater connectivity through a burgeoning network of railroads.

With the decline of coal extraction in the 1880s, mining boomtowns dwindled and agricultural regained preeminence. The waterfront proved ideal for shipping, as the bay remained deep enough even at low tide to permit the passage and docking of steam vessels. Further, the Southern Pacific and Santa Fe Railroad lines passing through the area along Suisun Bay allowed for increasingly productive agricultural transfer and storage. Wharves and warehouses were built along the shoreline of the Carquinez Strait, storing abundant agricultural production, most notably wheat. A further shift in land use occurred in the 1890s with the development of the short-lived Copper King Smelting Company Plant. Sited at Seal Bluff Landing, the plant increasingly drew men and material to the coastal area. While the company declared bankruptcy in 1903, the area boasted many amenities including a post office, a general store, and a saloon. Upon the heels of the company's failure, a new venture came to dominate the area when C. A. Smith developed a substantial lumber processing complex at Seal Bluff Landing. Employing over 2,000 workers, the company established the town-site of Bay Point, later called Port Chicago. Despite a 1913 fire which destroyed virtually the entire stock of lumber, the company remained a dominant figure in the area until the Great Depression when a diminished demand for lumber forced the plant's closing.

In the early twentieth century, two additional railroad lines were constructed in the area: the Bay Point & Clayton; and the Sacramento Northern Railroad (then called the Oakland, Antioch and Eastern Railway). With ample rail and shipping capabilities, the area was well suited to respond to the military demands of the First World War. In 1917 the War Department entered into a contract with the Electro Metals Company and the Pacific Ship Building Company to build freighters for the war effort. Situating themselves at Bay Point, the wartime production facilities assured continued expansion in the area. The town of Clyde was a product of this boom and was established to provide much needed support businesses and residences. Even with the abandonment of the production facilities at the close of the War, the surrounding towns remained populated throughout the 1920s and 1930s.

Central Valley Project

The United States Bureau of Reclamation's (USBR) constructed the Contra Costa Canal in the LUP area just prior to World War II. The Contra Costa Canal (with its subsidiary, the Clayton Canal) is a component of the Central Valley Project, the massive and innovative water project implemented to address the need for fresh water distribution for industrial, agricultural and residential use throughout California.

Construction of the Central Valley Project began in 1935 as a federal reclamation project, ensuring that the USBR would be the constructing agency and that the system would remain in federal ownership for the foreseeable future. The plan was composed of five units operating as an integrated system. They were the Shasta Dam, the Delta- Mendota Canal, the Friant Dam, the Friant-Kern Canal and the Contra Costa Canal. The Shasta Dam and the Delta-Mendota Canal operated together to store and deliver Sacramento River water as far south as Fresno County. The Friant Dam and the Friant Kern Canal also operated together to store San Joaquin River water to the southern extremes of the Central Valley. The Contra Costa Canal, the least integrated and smallest of the initial units, was designed to deliver water to farms, industries and homes in the Sacramento-San Joaquin Delta and northern Contra Costa County. The major initial units were finished in the early 1950s. In subsequent decades, the USBR has greatly expanded the system, adding or absorbing reservoirs, canals, pipelines, pumping plants, and other units.

During the construction of the Contra Costa Canal, smaller branches were built from the main canal to service more specific areas. The Clayton Canal was built between 1947 and 1948 and begins within the former CNWS, approximately 0.38 miles south of where Willow Pass Road runs under State Route 4. The Clayton Canal, while no longer in use, is approximately 4.8 miles long.

Both canals have a series of bridges and culverts which facilitate crossing the roadways and railroad crossings over those canals. JRP recorded and evaluated 13 bridges in the LUP area. Four bridges, constructed mainly out of timber, were built to carry farm vehicles only. The remaining nine bridges, erected by the USBR or the Navy, were constructed with concrete and steel, and were meant to carry either heavy duty military vehicles or rail road cars.

World War II Era: 1942–1945

With the bombing of Pearl Harbor, American military officials and political leaders oversaw an unprecedented expansion of America's military facilities as they sought to transform outdated and inadequate military installations into a functioning modern wartime machine. The Navy established Naval Magazine Port Chicago (NMPC) in February 1942, naming it after the adjacent town. The facility was the first new naval depot designed to specialize in ammunition transshipment for use in overseas combat. It was planned as a permanent addition to the Navy's shore establishment, rather than simply a temporary wartime facility. NMPC received ammunition manufactured and tested at the remote inland naval ammunition depot at Hawthorne, Nevada. Initially, the facility was responsible for some assembly and quality control, but served mostly as an ordnance storage, maintenance and loading point for the growing Pacific Fleet.

NMPC was established as a subordinate command to the sole existing ammunition transshipment point for the 12th Naval District, the depot at Mare Island. Upon opening, the station boundaries encompassed 640 acres of tideland on the south side of Suisun Bay, approximately midway between Martinez and Pittsburg. By November 1942 the original facilities were in place, including an ammunition pier, a barge pier, barricaded railroad sidings, storage buildings, housing for officers and enlisted men, guard buildings, a commissary, and an administrative building.

Throughout the years of 1944 and 1945 the facility expanded inland, where numerous barricaded sidings, magazines, storehouses, and auxiliary buildings to accommodate military personnel were constructed. During this period, the Navy also added to the size of the tidal area by condemning roughly 600 acres for the construction of a recreational building, bachelor officers' quarters (BOQ) and additional barracks and mess facilities.

Shortly after completion of this second phase of growth, the station suffered the largest domestic war-related loss of life during World War II, when a massive explosion occurred on the piers. On July 17, 1944, while sailors were loading ammunition onto waiting vessels, two explosions completely destroyed Pier #1, sinking two docked ships, and killing 320 military personnel, primarily African American stevedores and longshoremen. An additional 390 civilians and military personnel were injured. In the weeks following the explosion, many of the surviving ammunition loaders refused to load waiting ships, leading to the infamous "Port Chicago Mutiny" that resulted in the court martial, conviction and imprisonment of 50 enlisted men.

Despite the controversy, the Navy worked quickly to bring the facility back into service and by the closing months of 1944 six deep-water berths along a new ammunition pier, Pier #2, were ready to receive ships. Another pier, Pier #3, soon followed. By 1945, NMPC also included active facilities inland, including 75 high-explosive magazines located in the hills, a group of 93 gun-ammunition magazines on the flat land, and 30 barricaded sidings built along sidings fanning out amidst the hills. The new piers, new construction and expanded storage areas soon enabled the base to take over the functions of the old Mare Island ammunition depot.

At the close of World War II, the Bureau of Ordnance reported that NMPC "had become the principal ammunition loading port and storage point for ammunition and high explosives on the Pacific Coast." The Bureau also noted that the station was unusual in the diversity of ordnance it handled. While other stations loaded greater quantities of ammunition, few were capable of handling as many distinct types of ammunition. The primacy of NMPC's role in supplying the Pacific Fleet throughout World War II assured the station a continued strategic place in the years following the War. Despite some diminishment of scale, for example the installation of only 55 sidings for rail cars rather than the originally slated 550, the facility remained a powerful and fully functioning station as the United States entered a new political and militaristic era: the Cold War.

Cold War Era: 1946–1989

During the early years of the Cold War (1946–1963), the NMPC served as a weapons storage facility; providing support to the naval fleet. By 1946, NMPC had become the principal loading

and storage point for ammunition and high explosives on the West Coast. Further, it existed as the Navy's sole high explosives loading facility on the west coast that was located in a relatively remote area. Depots at Mare Island, Puget Sound, and San Diego were all situated in close proximity to densely populated areas and thus faced greater political and social pressures, as well as expansion challenges.

During the Korean War of 1950–1953, NMPC handled 75 percent of all ammunition sent to US forces in the Korean Peninsula. The NMPC installation became the Naval Ammunition Depot Concord (NAD, Concord), replacing NAD, Mare Island, which was in turn reclassified as the Mare Island Annex. NAD, Concord's ascendancy to independent command was accompanied by technological advancements in weapons. In July 1963, NAD, Concord was again re-designated, this time with its most recent identification of United States Naval Weapons Station, Concord (also known as the CNWS). The CNWS participated in several Department of Defense programs, such as the Polaris Fleet Ballistic Missile Program, Air-launched Missile Programs, and the Special Weapons Program. The installation also boasted an Advanced Weapons Division and a Guided Missile Facility.

During the Vietnam War years (1964–1972), the facility continued to provide support for military efforts, including the transshipment of ordnance, and other supplies, to US troops in all branches of the military serving in Southeast Asia. Deliveries often included mail, water, and personnel transfers. In support of the war, the station processed as much as 100,000 tons of munitions each month. Citing concern for the civilian population in the event of an explosion similar to that during World War II, the Navy succeeded in condemning the town of Port Chicago as part of its program to provide a buffer zone around the depot. The following year, with the inhabitants relocated, the Navy razed nearly all of the buildings and structures in the town.

From 1973 to the end of the Cold War in 1989, the facility continued its mission of supplying ammunition, loading and unloading ships, re-arming ships, and maintaining and assembling missiles. The CNWS included three ammunition piers, about 200 ammunition magazines and more than 150 buildings by this time, and infrastructure included 75 miles of paved roads and over 100 miles of railroad track.

As a direct result of the end of the Cold War in 1989 and the subsequent cessation of the military's strong demands for personnel and materiel, the station saw a reduction in workforce and volume of ordnance shipped and stored. The station's value to the Navy was still acknowledged and the CNWS survived multiple rounds of base closure (or BRAC) determinations that shuttered many facilities across the United States. In November 2005, however, the CNWS was recommended for partial closure and realignment. The final BRAC determination resulted in closure at the end of 2008.

Existing Conditions

ESA completed a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System on March 5, 2015 (File No. 14-1164). EBRPD also provided recently completed cultural resources studies not on file at the NWIC. The purpose of

the background research was to (1) determine whether site conditions have changes since the completion of the most recent cultural resources studies; and (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites.

Known cultural resources within LUP area include 10 archaeological sites, two isolated finds, approximately 35 buildings and structures, and numerous ammunition magazines. As detailed below, of these resources, one built structure (the Contra Costa/Clayton Canal) is listed in the National Register of Historic Places (National Register) and California Register of Historical Resources (California Register) as a contributing element to the Central Valley Project, and one archaeological site has been recommended eligible for listing.

The remaining historic-era archaeological sites, prehistoric isolated finds, and built environment resources (including magazines; main and auxiliary buildings; bridges; railroads; water storage facilities; tunnels; and a small mine) are not included in or meet the eligibility criteria for listing in the National or California Registers.

Architectural and Structural Resources

Previous Studies

Several previous studies have been completed regarding cultural resources of the built environment in the LUP area. The most recent and comprehensive of these studies was the *Final Historic Building Inventory and Evaluation Update Report, Concord Naval Weapons Station Contra Costa County, California* completed in April 2013 for the CNWS BRAC (JRP, 2013). That report provided a summary of two studies completed in the 1990s.

JRP (1998) also completed an earlier inventory and evaluation of Cold War era, and several World War II era, buildings and structures in the *Inventory and Evaluation of National Register Eligibility of Cold War Era and Selected Other Buildings and Structures, Naval Weapons Support Facility*. That report included a historical context for Cold War development and evaluated 375 buildings and structures. JRP found none to be eligible for listing in the National Register.

William Self Associates (1993) evaluated World War II era buildings and structures in the *Cultural Resources Overview, Naval Weapons Station Concord, Contra Costa County, California*. This study included an inventory and evaluation of 506 World War II-era buildings and structures located at the CNWS. Only the Port Chicago National Memorial, located in the CNWS tidal area, was recommended eligible for listing in the National Register.

Known Resources and Significance Evaluation

As a result of the above inventories, a total of 422 cultural resources of the built environment were evaluated within the greater inland area of the CNWS. Approximately 35 buildings and structures as well as numerous ammunition magazines are within the LUP area. Primarily naval buildings and structures, the categories were divided by construction during World War II or the Cold War and included earth-covered storage bunkers (also known as ammunition magazines),

ordnance handling facilities, unused warehouses, administrative buildings, barracks, other military-related buildings, and the system of rail lines. JRP (2013) recommended that none of the buildings or structures meet the criteria for listing in the National or California Registers. The evaluators noted that “while it is apparent that the...CNWS played a substantive role in major military campaigns of the second half of the twentieth century, this role does not meet the high threshold of importance necessary to convey direct historical significance” and that the “accompanying lack of integrity further hinders any demonstration of significance” (JRP, 2014:63).

The Contra Costa Canal (and extension Clayton Canal) has been previously recommended eligible for listing in the National and California Registers as contributors to the Central Valley Project (JRP, 2002). The State Historic Preservation Officer (SHPO) concurred with this recommendation in March 2005 (FHWA050131A; OHP, 2012). The Canal was described as an “original and integral unit of the Central Valley Project” and was determined of historic significance at a state level as a part of the Central Valley Project and at a local level for its importance in the economic and industrial development of eastern Contra Costa County.

Within the LUP area are one bridge and two culverts over the Contra Costa Canal. Built either by the Bureau of Reclamation for farm access or by the Navy, JRP (2009) evaluated these structures, and recommended them as not eligible for listing in the National or California Registers, either individually or as contributing elements to the Central Valley Project.

Archaeological Resources

Previous Studies

Numerous archaeological resources studies were conducted within the LUP area between 1989 and 2007. The most recent intensive-level surface survey was completed in 2007 (Garcia-Herbst and Hale, 2008) in support of the CNWS BRAC. During that study a total of 5,197 acres were surveyed, including 4,158 acres intensively surveyed in walking transects spaced at no more than 25-meter intervals and 1,039 acres surveyed with a more mixed strategy within the steeply sloped upland region, focusing on ridges, mid-slope terraces, and watercourses. The goals of the survey were to revisit all previously recorded archaeological sites and document previously unrecorded historic-era and prehistoric archaeological sites and artifacts.

Subsequently, ASM Affiliates completed archaeological testing, as documented in the *National Register of Historic Places Evaluation of 21 Archaeological Sites in Support of the Environmental Impact Statement for Disposal and Reuse of the Former Naval Weapons Station* (ASM, 2014). In the LUP area, the evaluation efforts included subsurface archaeological testing at one prehistoric archaeological site and a combined rural landscape study and subsurface testing at four historic-era archaeological sites.

Known Resources and Significance Evaluation

Nine historic-era archaeological sites, one prehistoric archaeological site, and two prehistoric isolated finds were identified in the LUP area during the above-noted surface survey of the CNWS. Of these resources, five historic-era sites and both prehistoric isolated finds were

immediately recommended not eligible for listing in the National or California Registers and no further consideration of these resources was completed (Garcia-Herbst and Hale, 2008).

Five resources in the LUP area were subject to additional testing and evaluation (ASM, 2014). These resources included a prehistoric bedrock milling site (P-07-000861), the remains of a historic-era residence with outbuildings (CA-CCO-777H), a series of historic-era concrete foundations and artifacts possibly associated with dairy farming (CA-CCO-787H), a historic-era foundation and artifact scatter (CA-CCO-791H), and a historic-era stone cistern with an associated artifact scatter and windmill (P-07-000860).

Testing at prehistoric site P-07-000861 concluded a high data potential with respect to ethnographic and prehistoric research. This site contains unique cupule rock features, a bedrock mortar facility, and a light midden deposit, which collectively have significance in regards to research potential and National Register eligibility. ASM Affiliates recommended P-07-000861 eligible for National Register listing under Criterion A (associated with events significant to the broad patterns of our history) and Criterion D (has yielded and is likely to yield information important to prehistory). Based on this assessment, P-07-000861 is considered a historic property for the purposes of the National Historic Preservation Act (NHPA) and a historical resource under the California Environmental Quality Act (CEQA).

ASM Affiliates also evaluated the four historic-era resources in the LUP area (CA-CCO-777H, CA-CCO-787H, CA-CCO-791H, and P-07-000860) for National Register eligibility as part of a rural historic landscape study and archaeological testing program. The evaluation included 14 additional resources (totaling 18 historic-era resources in all) located within the greater inland area of the CNWS. Collectively, the evaluated sites were determined to not contain “sufficient information capable of collectively conveying a sense of the processes or components of a rural historic landscape that would be associated with late nineteenth through mid-twentieth-century agriculture” (ASM, 2014:9-15). Additionally, the lack of integrity at most of the sites and the absence of features that would support a rural historic landscape did not represent the characteristics of a rural historic landscape. Therefore, the collective evaluation of the 18 historic-era archaeological sites as a potential rural historic landscape did contain sufficient information for National Register eligibility. No further consideration of these resources is necessary as the sites are not considered a historic property for the purposes of the NHPA nor a historical resource under CEQA.

Regulatory Setting

Federal Regulations

Cultural resources are protected through the NHPA of 1966, as amended (54 U.S.C. 306108), and its implementing regulations. Prior to implementing an “undertaking” (e.g., federal funding or issuing a federal permit), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for

listing in the National Register. Under the NHPA, a property is considered significant if it meets the National Register listing criteria at 36 CFR 60.4, as stated below:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

- a) Are associated with events that have made a significant contribution to the broad patterns of our history, or
- b) Are associated with the lives of persons significant in our past, or
- c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that 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.

Federal review of projects is normally referred to as the Section 106 process. This process is the responsibility of the federal lead agency. The Section 106 review normally involves a four-step procedure, which is described in detail in the implementing regulations (36 CFR Part 800):

- Identify historic properties in consultation with the SHPO and interested parties;
- Assess the effects of the undertaking on historic properties;
- Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation; and finally,
- Proceed with the project according to the conditions of the agreement.

State Regulations

The State of California implements the NHPA of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation, as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The Office of Historic Preservation also maintains the California Historical Resources Inventory. The State Historic Preservation Officer is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Environmental Quality Act

CEQA, as codified in Public Resources Code (PRC) Sections 21000 et seq., is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a proposed project would have a significant effect on historical resources, including archaeological resources. The CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as

defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is an historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083 regarding unique archaeological resources. A unique archaeological resource is "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 it meets any of the following criteria.

- 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.
- 3) Is directly associated with a scientifically recognized important prehistoric or historic event or person" (PRC Section 21083.2 [g]).

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register, an historical resource must be significant at the local, state, and/or federal level under one or more 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.
- 2) Is associated with the lives of persons important in our past.

- 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.
- 4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

Local Regulations and Land Use Plans

City of Concord General Plan

The City of Concord General Plan includes the following relevant policies regarding cultural resources.

- POS-4.1.1: Preserve all City, State, and Federally designated historic sites and structures to the maximum extent feasible.
- POS-4.1.2: Consult with the State Office of Historic Preservation with respect to managing impacts of development and land use on historic and archaeological resources.
- POS-4.1.3: Preserve important historic and archaeological sites during new development, reuse, and intensification.
- POS-4.1.4: In identified sensitive areas, require archaeological studies as part of the development review process.

Concord Reuse Project Area Plan

The Concord Reuse Project Area Plan, which is incorporated by reference in the City of Concord General Plan, includes the following relevant policies regarding cultural resources.

- C-9.1: Prior to carrying out earth disturbing activities that would impact any identified historic site, implement measures for the preservation in place, or adequate data recovery, curation, and documentation of historic properties/historical resources.
- C-9.2: Prior to approving restoration or development of any park, open space, or recreation areas, implement cultural resources protection measures to control public access to areas where any identified cultural resources are located.
- C-9.3: Implement inadvertent discovery measures for the protection of undocumented cultural resources that may be revealed during construction activities.

These measures will include:

- Training of all construction personnel.

- On-site monitoring by a qualified archaeologist for all earth disturbing activities within the boundaries of documented resources areas and archaeologically sensitive areas.
- Procedures for the discovery of cultural resources during construction if an archaeological monitor is not present.

City of Concord Development Code (Chapter 18)

The City of Concord Municipal Code Chapter 18 (also called the Development Code) includes ordinances designed for cultural resources. Chapter 18.450 Historic Preservation provides standards to protect recognize, preserve, and enhance areas, places, sites, buildings, and structures of historic, community, or aesthetic interest or value. Under this code, no person shall alter the exterior of, construct improvements to, demolish, or relocate any structure or alter the appearance of any property designated as a city historic landmark except in compliance with the requirements of the code. The chapter also outlines the procedures for nominations of areas, places, sites, buildings, structures, and similar objects for designation as landmarks or districts.

Recommendations

Architectural and Structural Resources

JRP (2009) recommended that none of the buildings or structures in the LUP area are eligible for listing in either the National or California Registers. No further consideration of these resources is necessary for the LUP.

The Contra Costa Canal (and extension Clayton Canal) have been previously recommended eligible for listing in the National and California Registers as contributors to the Central Valley Project (JRP, 2002). These resources are owned separately by the Bureau of Reclamation and would not be impacted by the LUP; no further consideration of these resources is necessary for the LUP.

Archaeological Resources

The LUP would include bicycle and/or pedestrian trails and promote recreational activities in the areas designated for open space. These activities could result in direct and indirect impacts to a prehistoric archaeological resource (P-07-000861) recommended eligible for listing in the National and California Registers (ASM, 2014). Impacts could include vandalism, destruction, theft, and other actions that would adversely affect the site.

In order to protect the site, the public would be educated about cultural resources in the LUP area through interpretive information, signs, brochures, and other activities offered within the recreation and open space areas. The public would also be informed that artifact collection is prohibited. Although public education would likely reduce the potential for impacts to occur, indirect impacts to the archaeological site could potentially be significant.

The EBRPD would be required to implement cultural resources protection measures including, but not limited to, designing bicycle and/or pedestrian trails, signs, and other recreation facilities

to avoid direct impacts to P-07-000861, thereby preserving and avoiding the site. Trails and signs would be designed and vegetation employed to minimize indirect effects.

While no additional known archaeological resources are located in the LUP area, the discovery of unknown resources cannot be entirely discounted. In the event of an unanticipated find of archaeological resources and/or human remains the following actions are recommended:

- **Halt Work if Archaeological Resources are Identified.** If archaeological resources are encountered, all activity within 100 feet of the find should immediately halt until it can be evaluated by a qualified archaeologist (and a Native American representative if the artifacts are prehistoric). Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. If the archaeologist (and Native American representative) determines that the resources may be significant, they would notify the EBRPD. An appropriate treatment plan for the resources would be developed. The archaeologist would consult with Native American representatives in determining appropriate treatment for prehistoric or Native American cultural resources.

In considering any suggested mitigation proposed by the archaeologist and Native American representative, it would be determined whether avoidance is feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is not feasible, other appropriate measures (e.g., data recovery) would be instituted. Work may proceed in other parts of the project vicinity while mitigation for archaeological resources is being carried out.

- **Halt Work if Human Remains are Identified.** If human skeletal remains are uncovered during project construction, work should immediately halt within 100 feet of the find. The EBRPD would contact the Contra Costa County coroner to evaluate the remains and follow the procedures and protocols set forth in Section 15064.5 (e)(1) of the CEQA Guidelines. If the County coroner determines that the remains are Native American, the EBRPD would contact the Native American Heritage Commission, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by AB 2641). The Native American Heritage Commission would then identify the person(s) thought to be the Most Likely Descendent of the deceased Native American, who would then help determine what course of action should be taken in dealing with the remains.

References

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APPENDIX B-3

BIOLOGICAL RESOURCES



H. T. HARVEY & ASSOCIATES

Ecological Consultants



**Concord Hills Regional Park
Biological Resources
Existing Conditions Report**

Project # 3665-01

Prepared for:

East Bay Regional Park District

2950 Peralta Oaks Court

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30 April 2015

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Section 1.0 Introduction

This report describes the biological resources present within the area under consideration for the Concord Hills Regional Park Project. It includes a description of the proposed Project, study methodology, affected environment, and proposed conservation measures.

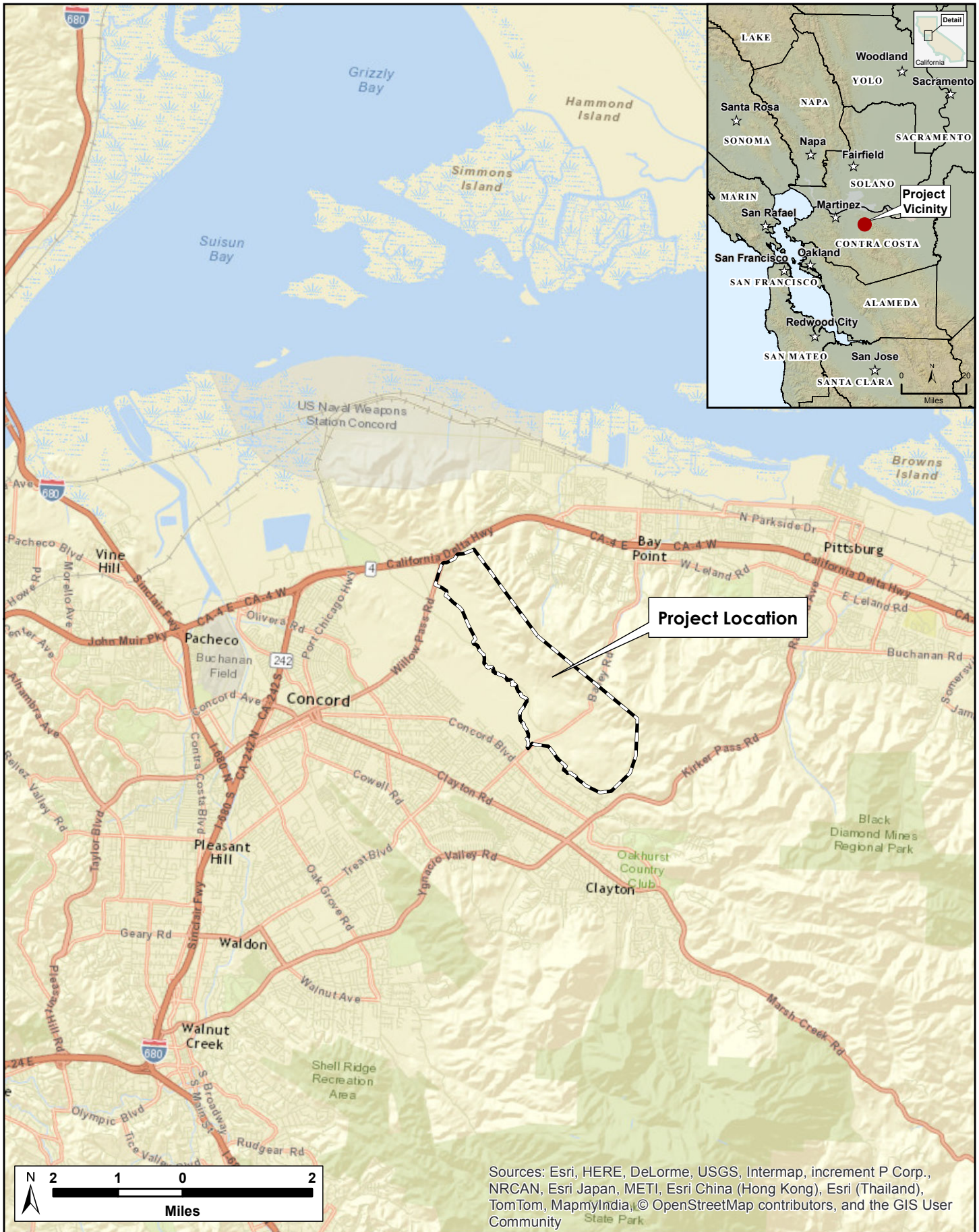
1.1 Project Description

1.1.1 Project Location

The Concord Hills Regional Park Project is located east of Suisun Bay in Concord, California, approximately 35 miles (mi) east-northeast of San Francisco in northern Contra Costa County, California (Figure 1). The Project site occupies 2638.78 acres (ac) of what was formerly the Inland Area of the Concord Naval Weapons Station (CNWS). The Project site is bound on the north by the Los Medanos Hills, on the south by the Concord Reuse Project Area (CRP-Area) and developed areas of the City of Concord, on the east by rangelands and residential development, and on the west by Willow Pass Road (Figure 2). The Project site is located in the *Vine Hill, Walnut Creek, and Clayton, California* U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles, Township 2 North, 1 West, Sections 17, 21, 27, 28, 34, 35, and a portion of the Monte Del Diablo Land Grant.

1.1.2 Proposed Project

It is anticipated that the future regional park will provide a full range of trail opportunities, wildlife preservation, and environmental and historic interpretation including a partnership with the National Park Service to develop a joint visitor highlighting the history of the Port Chicago Naval Magazine National Memorial.



N:\Projects\3600\3665-01\Reports\Fig 1 Vicinity Map.mxd

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



H.T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 1. Vicinity Map

Concord Hills Regional Park
Biological Resources Existing Conditions Report (3665-01)
March 2015



N:\Projects\3605\3665-01\Reports\Fig 2 Project Site.mxd

Figure 2. Project Site
Concord Hills Regional Park
Biological Resources Existing Conditions Report (3665-01)
March 2015

Section 2.0 Methodology

To identify existing biological conditions, as well as species and habitats of concern that occur or may occur on the Project site, a number of information sources were reviewed. These sources included Rarefind data (California Natural Diversity Database [CNDDDB] 2015) for the *Clayton*, *Vine Hill*, and *Walnut Creek*, California USGS 7.5-minute topographic quadrangles within which the Project site is located; Calflora (2015); the California Native Plant Society's (CNPS's) Electronic Inventory of Rare and Endangered Plants of California (CNPS 2015); information available through the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW); and survey data and previous reports prepared for the Project area, including the following surveys and literature.

2.1 Surveys

An extensive body of information exists documenting the biological resources found at the former CNWS, including the proposed Project site. The following studies were reviewed during preparation of this report.

- **Navy (1981–1982).** The Department of the Navy (Navy) conducted a resources survey of the CNWS in 1981-1982 (Jones and Stokes 1982). This study inventoried the wildlife on the CNWS, including the proposed Project site, to identify the presence and distribution of bird, mammal, amphibian, and reptile species by habitat type and season; to determine the occurrence of special-status species; and to identify important wildlife habitats.
- **Navy (1998–1999).** The Navy sponsored studies conducted by the University of Arizona Advanced Resources Technology Group in 1998-1999 (Downard et al. 1999). The University of Arizona team conducted a site-wide inventory of common and special-status birds, mammals, amphibians, reptiles, and plants on the CNWS, including the proposed Project site. Biological surveys included assessments at the same survey points used in the 1981–1982 surveys (Jones and Stokes 1982) to allow for comparative analysis. The multi-season surveys resulted in a substantial and relevant historical database for the biological resources analysis required for this Environmental Impact Report (EIR), describing most habitats and species present on the Project site. Surveys that are more recent have verified that site conditions have changed relatively little since the 1998-1999 surveys were conducted, and their results are thus directly relevant to this EIR.
- **Navy (2002).** Biological survey data collected as of 2002 were compiled and summarized by the Navy in its *Integrated Natural Resources Management Plan and Environmental Assessment* (Tetra Tech Inc. 2002).
- **Navy (2005–2006).** The Navy's 2005–2006 assessment of the population and distribution of the California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*) on the CNWS was conducted by Smallwood and Morrison (2007). Surveys included sampling points that were surveyed in previous studies to allow for detection of possible trends in populations and distribution of these species.

- **City of Concord Site Surveys (2007–2009).** Field surveys of the Inland Area of the CNWS, including the proposed Project site, were conducted for the City of Concord in February 2007 and February 2008 to assess existing vegetative cover and wildlife habitat, potential for occurrence of special-status species, and general presence of any sensitive biological resources, such as wetlands, sensitive natural communities, or mature native trees (CH2M HILL 2008a).

H. T. Harvey & Associates biologists conducted verification surveys in 2008 and 2009 (City of Concord 2010) to further refine assessments regarding the distribution of habitats and special-status species, as well as general wildlife use, on the site. These biologists included ornithologists, herpetologists, mammalogists, botanists, and wetlands ecologists who visited the site on a number of dates between November 2008 and June 2009. Collectively, these surveys documented that conditions have not changed appreciably since the multi-season 1998–1999 surveys conducted by the Navy, and that the results of the comprehensive surveys performed in 1998–1999 (Downard et al. 1999) are thus still applicable to the Project site.

- **City of Concord Stream Assessments (2007–2008).** The City of Concord conducted investigations to further characterize the condition of Mt. Diablo Creek, which provides (or could provide) habitat for a variety of wildlife species (CH2M HILL 2008b-e). To evaluate the potential value of this stream to wildlife, the City of Concord assessed existing conditions and identified future opportunities that will guide decisions for possible management of the creek’s riparian corridor. The effort included an analysis of the flood corridor conveyance, stream flow, sediment transport, and water temperature. These studies also included a fish passage assessment to evaluate the existing potential for fish to move through culverts within the reach of Mt. Diablo Creek adjacent to the Project site (CH2M HILL 2008e).
- **Special-status Plant Surveys (2008).** The City of Concord conducted focused plant surveys of the Inland Area of the CNWS, including the proposed Project site, in 2008 (Vollmar Consulting 2008). Three rounds of surveys were conducted to correspond to early, peak, and late special-status plant occurrence seasons. The surveys assessed the general plant communities on the CNWS and described sensitive habitats and the occurrence of special-status plants and noxious weeds.
- **Navy (2008–2009).** The Navy conducted surveys or habitat assessments to supplement previously compiled information on biological resources of the CNWS, including the proposed Project site. A study of California tiger salamander upland habitat considered previously identified breeding locations, the distribution of small mammal burrows, potential impediments to dispersal, and information concerning this species’ dispersal capabilities to evaluate various areas on the site according to their upland habitat value (EDAW 2008a). This study ranked the relative value of various sections of the site as upland habitat for California tiger salamanders based on proximity to known breeding ponds, abundance of upland refugia, and location relative to impediments such as Mt. Diablo Creek and Willow Pass Road.

A habitat assessment was conducted for the Alameda whipsnake (*Masticophis lateralis euryxanthus*) (Ecology & Environment and Swaim Biological 2008) and least Bell’s vireo (*Vireo bellii pusillus*) (Ecology & Environment 2008) to determine the potential for these species to occur on the CNWS. A protocol-level

survey for the least Bell's vireo was conducted in spring and summer 2009 (Ecology and Environment, Inc. and Foothill Associates 2009) to confirm presence or absence of this species on the CNWS.

Surveys for federally listed vernal pool branchiopods such as the vernal pool fairy shrimp (*Branchinecta lynchi*) (EDAW 2008b) were conducted according to the USFWS protocol.

The Navy also conducted an investigation of potential jurisdictional wetlands and other waters of the U.S./State in 2007 (Tierra Data Inc. 2008). This study assessed potentially jurisdictional features on the site and described observations of plant and wildlife species.

- **City of Concord Wetland Monitoring, Mapping, and Delineation (2008–2009).** Surveys were conducted in spring and summer 2008 to determine the location and extent of potential wetlands and other waters of the U.S./State on the Inland Area of the CNWS, including the proposed Project site (Vollmar Consulting 2008). In November 2008, H. T. Harvey & Associates began intensive, detailed monitoring of hydrology and vegetation in areas preliminarily identified in previous studies as potential wetlands and other waters of the U.S./State. The purpose of this effort was to refine the prior studies in order to definitively determine the location and precise boundaries of regulated wetland and other aquatic features on the Inland Area of the CNWS. After more than four months of monitoring and preliminary mapping of jurisdictional boundaries, the City arranged a site visit by a representative from the U.S. Army Corps of Engineers (USACE) to inform the precise delineation of jurisdictional wetlands and other aquatic features. Hydrology and vegetation monitoring were then continued through the spring of 2009, resulting in precise mapping of jurisdictional wetlands and aquatic features, which was ultimately verified by the USACE (USACE 2011).
- **City of Concord California Tiger Salamander Survey (2011).** In spring 2011, H. T. Harvey & Associates conducted protocol-level California tiger salamander surveys in 96 pools in the northwestern portion of the Inland Area of the CNWS, including seven pools scattered throughout the northern portion of the Project site, to determine the presence or absence of the California tiger salamander (H. T. Harvey & Associates 2011a). California tiger salamander larvae were not detected in any of the ponded-water features sampled.

2.2 Literature

The site-specific survey work reviewed and referenced during the preparation of this analysis is documented in numerous publications. The following documents and databases provided the primary sources of information for this EIR:

- CH2M HILL. 2008a. Technical Memorandum: Field Reconnaissance Surveys, Concord Community Reuse Project, Contra Costa County, California. March.
- CH2M HILL. 2008b. Technical Memorandum: Flow Gage Installation and Hydrology Evaluation at the Concord Naval Weapons Station, Inland Area. September.

- CH2M HILL. 2008c. Technical Memorandum: Sediment Transport Assessment at the Concord Naval Weapons Station, Inland Area. September.
- CH2M HILL. 2008d. Technical Memorandum: Water Temperature Monitoring at the Concord Naval Weapons Station, Inland Area. September.
- CH2M HILL. 2008e. Technical Memorandum: Fish Passage Assessment of Existing Stream Crossing Structures at the Concord Naval Weapons Station, Inland Area. September.
- CH2M HILL. 2008f. Technical Memorandum: Wildlife Movement, Concord Community Reuse Plan. March.
- City of Concord. 2010. Concord Community Reuse Plan Final Environmental Impact Report (FEIR). January 2010.
- Contra Costa Resource Conservation District (CCRCD). 2006. Mount Diablo Creek Watershed Assessment. Mount Diablo Creek Watershed Coordinated Resource Management Planning Program. January 30.
- Contra Costa County. 2006. Final East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan (ECCC HCP/NCCP) EIR. Although the proposed Project site is not located within the ECCC HCP/NCCP boundary, the ECCC HCP/NCCP EIR does discuss habitats and species occurrences in the immediate vicinity of the Project site. Thus, the ECCC HCP/NCCP was reviewed to provide additional information on relevant habitats and potential occurrence of special-status species at the Project site.
- Navy. 2006. Environmental Condition of Property Report for the Naval Weapons Station Seal Beach Detachment Concord, Concord, California. April.
- Navy. 2014. Draft Environmental Impact Statement (EIS) for the Disposal and Reuse of the Former Naval Weapons Station Seal Beach, Detachment Concord, Concord California. October.
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- Ecology & Environment, Inc. 2008. Least Bell's Vireo Habitat Assessment in Support of the EIS for Disposal and Redevelopment of the Naval Weapons Station Seal Beach Detachment, Concord, California. July.
- Ecology & Environment, Inc. and Swaim Biological. 2009. Alameda Whipsnake Habitat Assessment in Support of the EIS for Disposal and Redevelopment of the Naval Weapons Station Seal Beach Detachment, Concord, California. October.
- Ecology and Environment, Inc., and Foothill Associates. 2009. Least Bell's Vireo Survey Report – In Support of the EIS for Disposal and Redevelopment of the Former Naval Weapons Station Seal Beach

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- EDAW. 2008a. Final California Tiger Salamander Upland Habitat Study Report. Naval Weapons Station Seal Beach Detachment. Concord, Contra Costa County, California. December.
- EDAW. 2008b. Listed Vernal Pool Branchiopod Wet-Season and Dry-Season Surveys, 90-Day Report. Naval Weapons Station Seal Beach Detachment. Concord, Contra Costa County, California. August.
- H. T. Harvey & Associates. 2011a. Concord Community Reuse Plant California Tiger Salamander Larval Survey Report. 25 August 2011.
- H.T. Harvey & Associates. 2011b. Concord Community Reuse Plan Concord, California Preliminary Delineation of Wetlands and Other Waters. September 2011.
- H.T. Harvey & Associates. 2012. Biological Assessment for the Concord Reuse Project – Area Plan Concord, California Addressing the Central California Coast Steelhead, California Tiger Salamander, California Red-legged Frog, Alameda Whipsnake, and San Joaquin Kit Fox. November 2012.
- Jones and Stokes Associates, Inc. 1982. A Natural Resource Survey: Naval Weapons Station, Concord, CA. Report prepared for the Natural Resources Management Branch, Western Division, Naval Facilities Engineering Command, U.S. Navy San Bruno, California.
- Mount Diablo Audubon Society. Central Contra Costa County Christmas Bird Count Results. Unpublished data provided by count compiler Jimm Edgar.
- Natural Heritage Institute. 2006. Mt. Diablo Creek Watershed Inventory, Final Report.
- Smallwood, K.S. and M.L. Morrison. 2007. A Monitoring Effort to Detect the Presence of the Federally Listed Species California Tiger Salamander and California Red-legged Frog at the Naval Weapons Station, Seal Beach, Detachment Concord, California. Report prepared for the Navy.
- Tetra Tech, Inc. 2002. Integrated Natural Resources Management Plan and Environmental Assessment. Naval Weapons Station Seal Beach, Detachment Concord, California.
- Tierra Data Inc. 2008. A Wetland Delineation and Aquatic Habitat Inventory for the Inland Area, Naval Weapons Station Seal Beach Detachment Concord, Concord, California. Report prepared for Naval Base Realignment and Closure Office, San Diego. California. January.
- Vollmar Consulting. 2008. 2008 Sensitive Botanical Resources Survey Report. Concord Naval Weapons Station, Inland Area. September.
- Comments provided by state and federal resource agencies (e.g., CDFW, USFWS, Regional Water Quality Control Board [RWQCB], USACE) during site visits and in written communications between 2007 and 2015.

Section 3.0 Existing Land Uses, Natural Communities, and Habitats

3.1 General Project Area Description

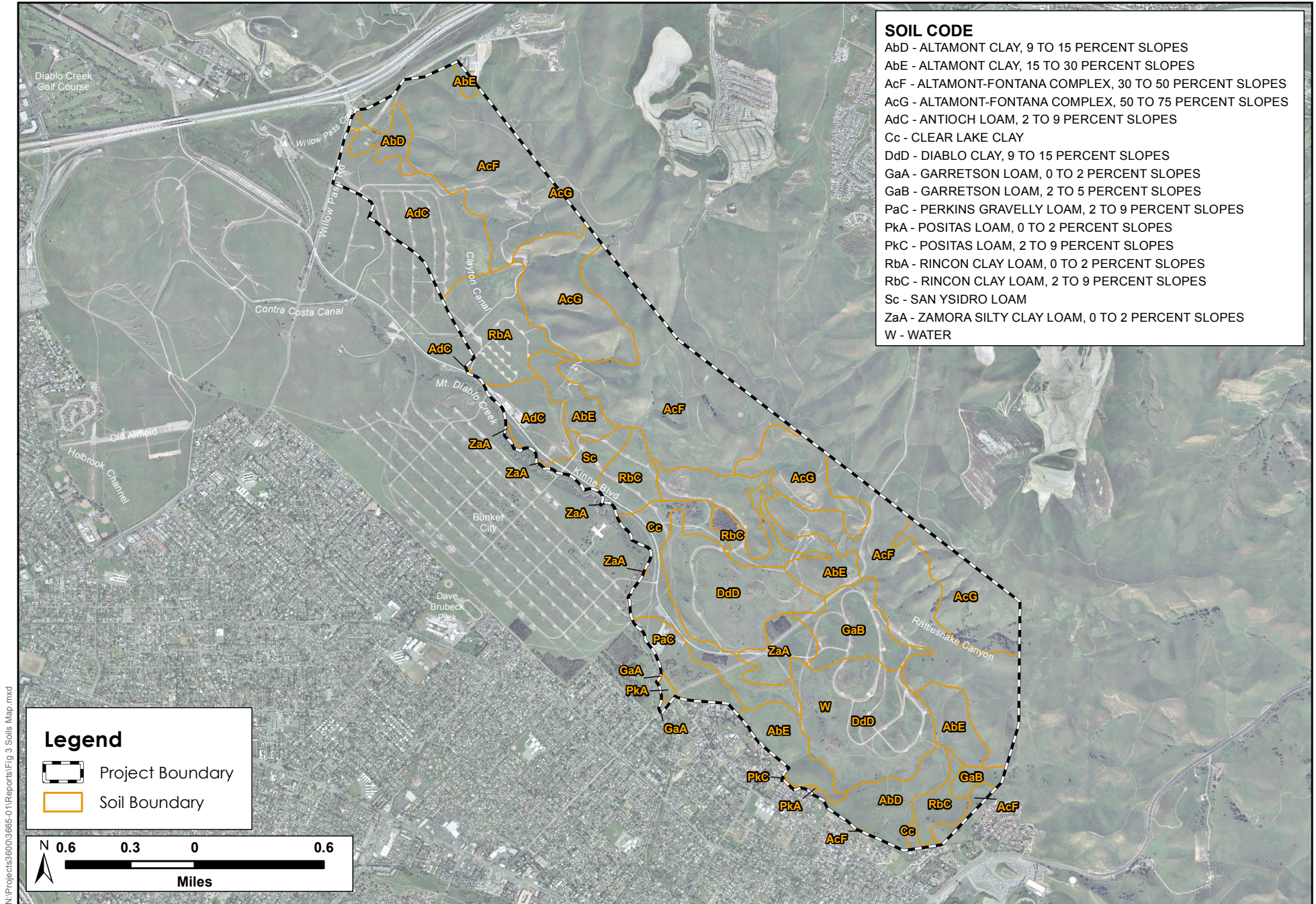
Historical agricultural and military uses, including farming, livestock grazing, munitions storage, and associated activities have extensively altered and influenced biological conditions throughout the approximately 2639-ac Project site. Most of the natural vegetation on the lower hills and flatland of the site was altered by farming practices between the late 1800s through the 1940s. Hay production likely altered or removed much of the native grasslands and natural plant communities in the lowlands. Between 1944, when the Navy purchased the site, and 1975, uncontrolled grazing was allowed year-round. After 1975, as leases became eligible for renewal, five-year leases specifying the maximum number of animal unit months for each allotment were issued.

Since 1944, the predominant military uses of the Project site consisted of high-explosive and gun magazines or storage bunkers. The Navy also constructed a rail system. Networks of roads, railroads, and utilities link the buildings across the site. The site is served by three major highways: Interstate Highway 680, State Route (SR) 242, and SR 4. The BART rail system also serves the area, passing just north of the Project boundary.

Portions of the site not used for munitions storage/transport areas have been exposed to relatively little direct human activity in recent decades. Nevertheless, the network of roads, rail lines, and munitions bunkers developed by the Navy has substantially altered runoff, drainage, and vegetation patterns in the Mt. Diablo Creek watershed in which the Project site is located. Mt. Diablo Creek, located just south of the south-central Project boundary, is the major hydrologic feature of the area. Currently, extensive fencing exists along the perimeter of the site, and it is not accessible to the public.

Site topography consists primarily of gently sloping lowlands with the steeper Los Medanos Hills along the eastern boundary. Elevations range from approximately 90 to about 1000 ft above sea level. The Clayton section of the Greenville Fault Zone runs northwest to southeast through the eastern portion of the Project site. The seventeen soil series found within the Project site are listed in Table 1 and shown on Figure 3.

The Project site experiences a Mediterranean climate, winters are cool and wet, while summers are warm and dry. Approximately 86 percent of the rainfall occurs between November and April (NHI 2006). Average annual precipitation in the Mt. Diablo Creek watershed varies from 23.5 inches at the summit of Mt. Diablo to 15.5 inches near Suisun Bay (Contra Costa County Resource Conservation District 2006).



N:\Projects\3665-01\Reports\Fig 3 Soils Map.mxd

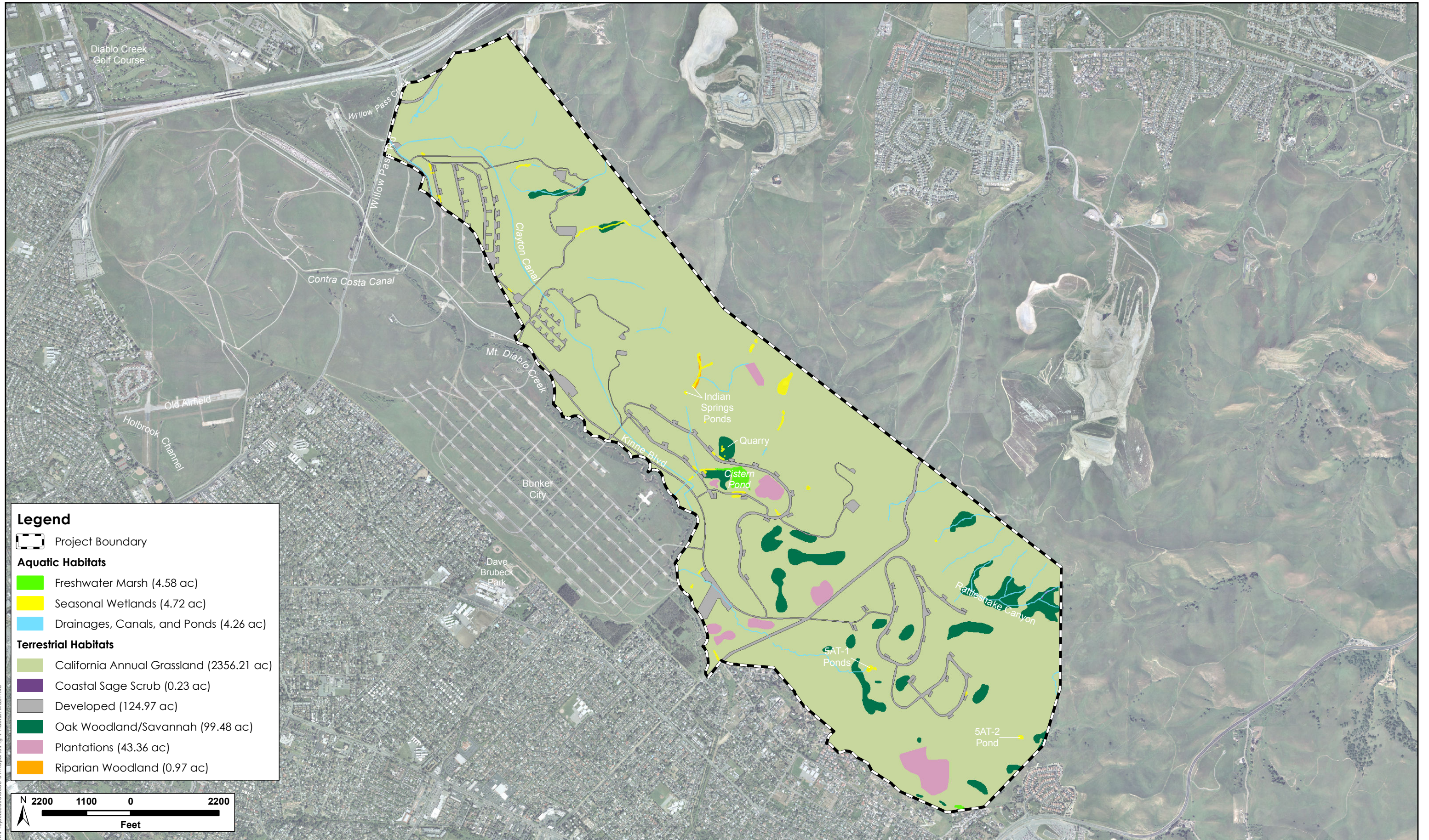
Table 1. Soil Types on the Project Site

Soil Series Symbol	Soil Series Name
AbD	Altamont clay, 9 to 15 percent slopes
AbE	Altamont clay, 15 to 30 percent slopes
AcF	Altamont-Fontana complex, 30 to 50 percent slopes
AcG	Altamont-Fontana complex, 50 to 75 percent slopes
AdC	Antioch loam, 2 to 9 percent slopes
Cc	Clear Lake clay
DdD	Diablo clay, 9 to 15 percent slopes
GaA	Garretson Loam, 0 to 2 percent slopes
GaB	Garretson loam, 2 to 5 percent slopes
PaC	Perkins gravelly loam, 2 to 9 percent slopes
PkA	Positas loam, 0 to 2 percent slopes
PkC	Positas loam, 2 to 9 percent slopes
RbA	Rincon clay loam, 0 to 2 percent slopes, MLRA 14
RbC	Rincon clay loam , 2 to 9 percent slopes, MLRA 14
Sc	San Ysidro loam
W	Water
ZzA	Zamora silty clay loam, 0 to 2 percent slopes

3.2 Existing Land Uses, Vegetation Communities, and Habitats

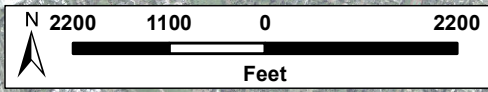
The following discussion describes the land uses, vegetation communities, and habitats present on the Project site. Because an animal's habitat (i.e., where it lives and reproduces in the environment) is largely determined by the vegetation present, both vegetation communities and habitats are commonly defined in terms of their dominant plant species (e.g., annual grassland, oak woodland), and this convention will be used in this analysis. Thus, in this document the terms "vegetation community" and "habitat" are used interchangeably; both refer to assemblages of vegetation that are similar in species composition, growth form, and other variables such as soil type or hydrologic conditions.

Nine vegetation communities/land uses were identified on the Project site: California annual grassland; coastal sage scrub; developed; oak woodland/savannah; plantations; riparian woodland; freshwater marsh; seasonal wetlands; and drainages, canals, and ponds. The general locations of these habitat types are shown on Figure 4, and the acreages associated with each vegetation community are provided in Table 2. The dominant and characteristic plant and animal species for each of these habitats are described below. These descriptions are derived largely from those in the *Concord Community Reuse Plan FEIR* (City of Concord 2010).



Legend

- Project Boundary
- Aquatic Habitats**
- Freshwater Marsh (4.58 ac)
- Seasonal Wetlands (4.72 ac)
- Drainages, Canals, and Ponds (4.26 ac)
- Terrestrial Habitats**
- California Annual Grassland (2356.21 ac)
- Coastal Sage Scrub (0.23 ac)
- Developed (124.97 ac)
- Oak Woodland/Savannah (99.48 ac)
- Plantations (43.36 ac)
- Riparian Woodland (0.97 ac)



N:\Projects\3600\3665-01\Reports\Fig 4 - Habitat Map.mxd

As can be seen by the acreages presented in Table 2, the vast majority of the site is characterized as California annual grassland. All sensitive plant communities combined (i.e., oak woodland/savannah; riparian woodland, freshwater marsh; seasonal wetlands; and drainages, canals, and ponds) total less than 5 percent of the acreage of the grasslands. Although of relatively high ecological value, the aquatic habitats on site occur as narrow bands or discrete features amongst an immense landscape of grassland species.

Table 2. Land Use and Vegetation Community/Habitat Acreages on the Project Site

Vegetation Community	Area (acres)	Percentage of Site
California annual grassland	2356.21	89.29
Coastal sage scrub	0.23	0.01
Developed	124.97	4.74
Oak woodland/savannah	99.48	3.77
Plantations	43.36	1.64
Riparian woodland	0.97	0.04
Freshwater marsh	4.58	0.17
Seasonal wetlands	4.72	0.18
Drainages, canals, and ponds	4.26	0.16
Total	2638.78	100.00

3.3 California Annual Grassland

3.3.1 Vegetation

California annual grassland is the most abundant vegetation community on the Project site (Photo 1), occupying more than 89 percent of the site. The California annual grassland found here is dominated by non-native annuals, including wild oats (*Avena fatua*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Lolium multiflorum*), and yellow star-thistle (*Centaurea solstitialis*). Yellow star-thistle is an extremely invasive species, and over 50 percent of the site exhibits cover levels of at least 25 percent (Downard et al. 1999).



Photo 1. California annual grassland.

This report includes all of the grasslands on the site under the single descriptor of “California annual grasslands,” while acknowledging that the grasslands are not entirely dominated by annual grasses and forbs but also include perennial grasses and bulbiferous species. While the floristic composition of this plant

community appears to be relatively uniform, localized assemblages of certain species within the grassland, such as native grasses or wildflowers, do occur on site as one might expect on such a large site with multiple soil types, aspects, and slopes. Although many different plant species occur within the grassland, including native grasses, they do not routinely form discrete pure stands, but are inevitably scattered throughout the broader annual grasslands at varying densities. As noted by Vollmar Consulting (2008), these plant assemblages include significant percentages of plant taxa other than grasses. Occurrences of many of these native species, such as wildflowers, depend greatly upon the distribution and amount of annual rainfall and many such plants may not be seen for many years. All of the populations of these native grasses and wildflowers have been observed on the relatively steep slopes of the Los Medanos Hills where the grazing intensity tends to be less and many north-facing slopes provide more mesic environmental conditions that are more favorable to these species. Observations by Vollmar Consulting (2008) also indicate that populations of noxious weeds are expanding within the annual grassland community.

Small, remnant stands of native, perennial grasslands were located on site in 2008 (Vollmar Consulting 2008) and in verification field surveys conducted by H. T Harvey & Associates during the preparation of the *Concord Community Reuse Plan FEIR* (City of Concord 2010). These native grasses occur in scattered stands of varying sizes within the broader annual grasslands and are primarily dominated by purple needlegrass (*Nassella pulchra*). Associate grass species include Sandberg bluegrass (*Poa secunda*), California fescue (*Festuca californica*), and California melic (*Melica californica*).

Localized stands of other native species occurring within the California annual grasslands include native wildflowers such as California poppy (*Eschscholzia californica*), purple owl's clover (*Castilleja exserta*), blue-eyed grass (*Sisyrinchium bellum*), and creeping wildrye (*Leymus triticoides*) (Vollmar Consulting 2008). In several locations, the upland species of this vegetation community intermix or co-occur with many of the wetland plants that dominate the seasonal wetlands described below. Where the upland grasses and forbs dominate, such areas were identified as occurring within the California annual grassland.

It is important to note that there are many locations within the California annual grasslands that are dominated by species adapted to, or able to tolerate, disturbance of the ground surface resulting from mechanical disking or import of soil fill material. The term "ruderal" is used to describe plant species that occur in weedy, disturbed areas that are typically dominated by non-native annual or perennial species. Such areas that have not experienced substantial disturbance (e.g., disking) for a number of years may develop into annual grasslands. Where vegetation is present, ruderal land cover is dominated by a mixture of non-native annual grasses and weedy species, such as black mustard (*Brassica nigra*), thistle (*Cirsium* spp.), and wild radish (*Raphanus sativa*), that tend to colonize quickly after disturbance. The rock quarry on the Project site is an example of a highly disturbed area with complex topography and vegetation. This area is characterized by steep slopes with loose, broken rock and numerous large boulders. Vegetation in this area consists mainly of grasses, fennel (*Foeniculum vulgare*), and woody plants such as coyote brush (*Baccharis pilularis*), valley oak (*Quercus lobata*), and *Prunus* spp. (Downard et al. 1999); however, several native herbaceous species including

California figwort (*Scrophularia californica*), blue dicks (*Dichelostemma capitatum*), and California poppy are found along the east side of the quarry.

3.3.2 Wildlife

In general, annual grasslands support relatively low wildlife diversity due to the structural simplicity of this habitat type. However, because the Project site provides broad expanses of grasslands, and because this habitat type occurs within a mosaic of small patches of oak woodland, wetlands, and other habitats providing additional breeding, feeding, perching, and cover resources for wildlife species, the California annual grasslands on the Project site provide relatively high-quality habitat for species typical of central California grasslands.

Characteristic wildlife species in annual grasslands on the Project site include reptiles such as the western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus viridis*). These species use small mammal burrows, denser patches of vegetation, rock outcrops, or other features within the grassland for cover. Amphibians such as the Sierran chorus frog (*Pseudacris regilla*) and western toad (*Anaxyrus boreas*) are widespread and are often found in moister areas within the grasslands on the site. California tiger salamanders spend most of their lives in subterranean refugia, typically small mammal burrows, and may disperse more than a mile from aquatic breeding areas; as a result, they are found in grassland throughout most of the Project site. Common mammals using these grasslands include the black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), and coyote (*Canis latrans*).

Only a few species of birds, primarily western meadowlarks (*Sturnella neglecta*), but also a few pairs of burrowing owls (*Athene cunicularia*), horned larks (*Eremophila alpestris*), killdeer (*Charadrius vociferus*), and mourning doves (*Zenaidura macroura*), nest on the ground within the site's annual grasslands. A number of other bird species that nest in adjacent habitats, or that occur on the site only as nonbreeders, forage regularly in grasslands on the site. These include the loggerhead shrike (*Lanius ludovicianus*), savannah sparrow (*Passerculus sandwichensis*), and a variety of raptors, such as the American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos*).

3.4 Coastal Sage Scrub

3.4.1 Vegetation

Coastal sage scrub, a shrub-dominated vegetation community, occupies a limited area on the site (comprising less than 0.01 percent of the site). This community occurs on a northwest-facing slope within Rattlesnake Canyon in the southeast corner of the Project site, forming a near monoculture of shrub species that are very

different from the surrounding vegetation types. This community is dominated by California sagebrush (*Artemisia californica*).

3.4.2 Wildlife

The coastal sage scrub habitat on the Project site is not extensive enough to support a distinctive wildlife community. As a result, most of the wildlife species using this habitat are associated more generally with dense scrubby vegetation or are characteristic of the adjacent California annual grassland and oak woodland habitats. Reptiles such as western fence lizards, California whiptails (*Aspidoscelis tigris munda*), and western rattlesnakes occur in this habitat. The only brush mouse (*Peromyscus boylii*) recorded on the CNWS was trapped in Rattlesnake Canyon (Downard et al. 1999), and this species may occur within the sage scrub. Birds such as the California towhee (*Pipilo crissalis*) and spotted towhee (*Pipilo maculatus*) may nest in the coastal sage scrub on the site, and the dense nature of this habitat provides cover for white-crowned sparrows (*Zonotrichia leucophrys*), golden-crowned sparrows (*Zonotrichia atricapilla*), and a variety of mammals.

3.5 Developed

3.5.1 Vegetation

Approximately 4.74 percent of the site consists of developed areas, including roadways, parking lots, and asphalt aprons surrounding buildings (Photo 2). Also included are a wide variety of structures, including buildings and bunkers. This relatively broad category is collectively used to describe any land surface on site that consists primarily of steel, asphalt, or concrete. Such areas often contain patches of ruderal vegetation as well as landscaped trees and shrubs. During construction by the Navy, the tops of the bunkers on the site were covered with soil, and a plant community similar in structure and composition to the adjacent grasslands has developed over the years. As such, the top of the bunker structures has been included in the California annual grassland vegetation community.



Photo 2. Developed areas.

3.5.2 Wildlife

Developed areas typically support a small suite of relatively common, often urban-associated wildlife species that are tolerant of periodic human disturbance. Non-native species associated with developed areas include the European starling (*Sturnus vulgaris*), rock pigeon (*Columba livia*), house sparrow (*Passer domesticus*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), and black rat (*Rattus rattus*). In addition, a number of

native species have adapted to these conditions. Native bird species commonly found in developed habitats on the site include the house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), Brewer's blackbird (*Euphagus cyanocephalus*), Anna's hummingbird (*Calypte anna*), and California towhee. Native mammals such as the deer mouse (*Peromyscus maniculatus*), raccoon (*Procyon lotor*), California ground squirrel, Botta's pocket gopher, and striped skunk (*Mephitis mephitis*) utilize these developed areas heavily as well. Unoccupied bunkers and other structures on the site also provide nesting and roosting habitat for some species of bats, such as the Yuma myotis (*Myotis yumanensis*), Brazilian free-tailed bat (*Tadarida brasiliensis*), and big brown bat (*Eptesicus fuscus*).

3.6 Oak Woodland/Savannah

3.6.1 Vegetation

Both oak woodland and oak savannah occur on the Project site, although they occupy only 3.77 percent of the site. The ECCC HCP/NCCP defines oak woodland as grassland with a tree canopy cover of greater than 10 percent. The majority of oak woodland found at the Project site (Photo 3), however, is in the form of small, clustered pockets of trees occurring on more mesic sites within the larger oak savannah/grassland. Therefore, the two community types are discussed together in this report. Typical oak



Photo 3. Oak woodland/savannah.

species present are coast live oak (*Quercus agrifolia*), blue oak (*Quercus douglasii*), and valley oak. Scattered buckeye trees (*Aesculus californica*) are a sub-dominant species of the oak woodlands in some of the deeper and more protected drainages within the Los Medanos Hills. The valley oak, coast live oak, and buckeye trees form closed canopies within the oak woodland communities in some of the ephemeral drainages on site, with forbs such as miner's lettuce (*Claytonia perfoliata* ssp. *perfoliata*), common chickweed (*Stellaria media*), and shepherd's purse (*Capsella bursa-pastoris*) forming the understory. Typical understory species in the oak savannah include the same suite of non-native annual grasses and forbs that occur in much of the California annual grassland habitat on site.

3.6.2 Wildlife

Due to the provision of food resources, structural diversity, and refugia such as cavities and hollows, oak woodlands support a distinctive and relatively diverse wildlife community. Common reptiles using oak woodlands on the site include the gopher snake and western fence lizard. Mammals such as the deer mouse

and gray fox (*Urocyon cinereoargenteus*) often occur in oak woodlands. The native western gray squirrel (*Sciurus griseus*) may occur here as well, though it is outnumbered by non-native eastern gray squirrels (*Sciurus carolinensis*) and fox squirrels (*Sciurus niger*) on the site. Representative birds using oak woodlands on the site include the red-tailed hawk, American kestrel, barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), northern flicker (*Colaptes auratus*), white-breasted nuthatch (*Sitta carolinensis*), oak titmouse (*Baeolophus inornatus*), western bluebird (*Sialia mexicana*), violet-green swallow (*Tachycineta thalassina*), California quail (*Callipepla californica*), western kingbird (*Tyrannus verticalis*), spotted towhee, Bewick's wren (*Thryomanes bewickii*), and bushtit (*Psaltriparus minimus*). Hollow oaks may provide nest sites for turkey vultures (*Cathartes aura*) and a variety of other birds, as well as dens for mammals. Bats often roost in cavities and crevices in oaks. Although the bat species of the Project site have not been well studied, a variety of species may occur here, possibly including the California myotis (*Myotis californicus*), Yuma myotis, big brown bat, pallid bat (*Antrozous pallidus*), and Brazilian free-tailed bat.

3.7 Plantations

3.7.1 Vegetation

The older eucalyptus groves on the CNWS were planted by homesteaders as windbreaks and shade trees during the late 1800s (Downard et al. 1999). Later, the University of California Cooperative Extension planted test groves of eucalyptus (Photo 4) to evaluate the cost of eucalyptus energy production (Sandiford and Ledig 1983). The U.S. Forest Service maintained several plantations at the site that consisted of test plantings of pine, including Coulter pine (*Pinus coulteri*) and others, and blue gum eucalyptus. Each stand has several hundred trees.



Photo 4. Eucalyptus plantation.

3.7.2 Wildlife

The pine and eucalyptus plantations provide habitat for various bird, mammal, and reptile species. Common reptiles include the gopher snake and western fence lizard. The deer mouse, eastern gray and fox squirrels, and gray fox also use these habitat types. The larger eucalyptus trees provide nest sites for large raptors such as the red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), white-tailed kite, and great horned owl; Bullock's orioles (*Icterus bullockii*), western kingbirds, and other birds nest in these trees as well, and eucalyptus flowers provide insects and nectar for a variety of bird species. Dense foliage within the pine plantations provides ideal roost sites for owls such as the barn owl.

3.8 Riparian Woodland

3.8.1 Vegetation

Riparian communities, from an ecological perspective, are generally described as a transition between aquatic habitats and the adjacent upland terrestrial habitats. They are identified by distinctive vegetation communities that generally border streams, creeks, and drainage channels. The vegetation becomes established in response to elevated moisture content of the soils resulting from flowing water on a seasonal or perennial basis. On the Project site, riparian woodland is very limited in extent and not well developed, occurring only adjacent to upper and lower Indian Springs. Vegetation consists mainly of scattered willows (*Salix* sp.).

3.8.2 Wildlife

Riparian habitats in California generally support exceptionally rich animal communities and contribute a disproportionately high amount to landscape-level wildlife species diversity. The presence of water, at least seasonally, and abundant invertebrate fauna provide foraging opportunities for many species, and the diverse habitat structure provides a variety of cover and nesting opportunities. However, the riparian woodland habitat on the Project site is very limited in size and structural diversity, reducing the diversity of species that this habitat can support. Thus, wildlife species found in this habitat are likely species typically associated with the adjacent grasslands and aquatic habitat.

3.9 Freshwater Marsh

3.9.1 Vegetation

Freshwater marsh is present on the Project site at the Cistern Pond (Photo 5), perennial stock ponds, portions of the Contra Costa Canal, and a marsh at the southeast border of the property. These areas occupy a very limited portion of the site (approximately 4.58 percent). What all of these features have in common is perennial, or near perennial, wetland hydrology that supports a predominance of emergent wetland plants.



Photo 5. Lower Cistern Pond.

Although wetland vegetation dominates these areas, there is typically an open water component to the freshwater marsh habitat that tends to be too deep to allow emergent vegetation to become established. The floristic composition of these wetlands is fairly variable, but typical dominant species include California bulrush (*Schoenoplectus californicus*), American bulrush

(*Schoenoplectus americanus*), cattails (*Typha* spp.), sedges (*Carex* spp.), and Baltic rush (*Juncus balticus*). Associate wetlands plants adapted to the moist soil conditions present around these areas include curly dock (*Rumex crispus*), annual beard grass (*Polypogon monspeliensis*), and bristly ox-tongue (*Picris echioides*). The perennial stock pond located just east of the Cistern Pond retains standing water well into August (Vollmar Consulting 2008). The dominant species occurring around the perimeter of this pond includes cosmopolitan bulrush (*Bolboschoenus maritimus*).

3.9.2 Wildlife

Freshwater marsh habitat on the Project site provides resources used by large numbers of wildlife species. Amphibians such as California red-legged frogs, California tiger salamanders, western toads, and Sierran chorus frogs breed in freshwater marsh such as that present at the Cistern Pond. This pond supports the only high-quality aquatic habitat for the western pond turtle (*Actinemys marmorata*) as well. Freshwater marsh elsewhere on the Project site is limited in extent, and habitat quality is lower. Nevertheless, marsh habitat in these areas supports common amphibians such as western toads and Sierran chorus frogs, and common garter snakes may occur in this habitat throughout the Project site.

Due to the limited extent of freshwater marsh habitat on the site, waterbirds associated with more extensive freshwater marshes (e.g., rails) are not expected to breed on the Project site. Nevertheless, waterbirds such as the mallard (*Anas platyrhynchos*) and American coot (*Fulica americana*) may breed in this habitat, and the green heron (*Butorides virescens*) and great blue heron (*Ardea herodias*) forage here. Red-winged blackbirds (*Agelaius phoeniceus*), song sparrows, and San Francisco common yellowthroats (*Geothlypis trichas sinuosa*) nest in wetland vegetation in and around freshwater marshes on the site, and limited numbers of marsh wrens (*Cistothorus palustris*) breed here as well. Many mammals frequent permanent wetlands for foraging and use them as a source of drinking water.

3.10 Seasonal Wetlands

3.10.1 Vegetation

The limited areas of seasonal wetlands, which occupy approximately 4.72 percent of the Project site, are generally supported by incident rainfall and runoff of excess moisture into topographic depressions, especially within the clay soils on the relatively flat grasslands, in low points, or behind man-made



Photo 6. Seasonal wetland.

impoundments. These areas include native channels, wetlands around the perimeter of seasonal stock ponds, and numerous shallow depressions within the grasslands (Photo 6), including those previously described by others as vernal pools¹. In contrast with the obligate emergent wetland plants found in the freshwater marsh habitats, the majority of seasonal wetlands on the site support a predominance of marginal wetland grass species (Vollmar Consulting 2008) such as Italian ryegrass (*Lolium perenne*) and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), as well as bristly ox-tongue and bird's-foot trefoil (*Lotus corniculatus*).

Drainage ditches associated with the railroad lines and roadways were excavated by the Navy at various locations within the relatively flat portions of the Project site. For the most part these drainage ditches remain entirely dry even during periods of average rainfall amounts. However, in some locations, topographic low points have formed from differential settlement of the underlying soil, or pools have formed behind sediment that has accumulated in the many years since these features were actively maintained by the Navy. Most of these seasonal wetlands support plants such as curly dock and annual beard grass, along with other annual hydrophytes (“water-loving plants”).

3.10.2 Wildlife

During the wet season, seasonal wetlands are used by a variety of wildlife, including various amphibians such as the Sierran chorus frog and western toad and shorebirds such as the killdeer, greater yellowlegs (*Tringa melanolenca*), and Wilson's snipe (*Gallinago delicata*). California tiger salamanders have been found breeding in seasonal wetlands on the Project site. During the dry season, most of the seasonal wetlands on the site provide wildlife habitat similar to non-native annual grasslands, and even burrowing mammals such as California voles, Botta's pocket gophers, and California ground squirrels may use seasonal wetlands during the dry season.

3.11 Drainages, Canals, and Ponds

3.11.1 Vegetation

This section describes linear drainage features, both natural and man-made, and impoundments. The important features that characterize these habitats are the presence of surface water (at least seasonally) and the general absence of vegetation. For the purposes of this discussion, these communities are divided into three main subcategories: drainages, canals, and ponds. These features occupy a limited portion of the Project site, collectively comprising approximately 4.26 percent of the site.

¹ After conducting intensive monitoring of surface hydrology and the floristic composition of seasonal depressional wetlands during the 2008-2009 rainy season (a season in which Concord received slightly below average rainfall for the year), H.T. Harvey & Associates concluded that vernal pools of the type that are underlain by soil having a restrictive subhorizon and supporting endemic plant species and/or invertebrate species are entirely absent from the CNWS (City of Concord 2010).

Drainages

Numerous non-vegetated drainages associated with the mid to upper slopes of the Los Medanos Hills drain minimal surface flows from the adjacent foothill grasslands onto the Project site during the winter rainfall period. The majority of the drainages are comprised of steep, narrow, swale-like features that extend in a westward direction toward Mt. Diablo Creek, which flows in a northwest direction along the south-central boundary of the Project site. In locations where the hillslope steepens, the channel incises with clear evidence of channel downcutting, erosion, and sediment transport. Occasional in-channel pools are present but do not pond water long enough to support wetland vegetation. Flows within these drainages are ephemeral in nature, only occurring during and immediately after relatively high rainfall events. The majority of these drainages transition into alluvial fans supporting upland grassland before reaching Mt. Diablo Creek. As a result, only a few of the drainages are hydrologically connected to Mt. Diablo Creek. The majority of the Los Medanos Hills drainages support only a minimal amount of herbaceous vegetation, including grasses and forbs comprised largely of non-native species.

Canals

Portions of the Contra Costa Canal and the Clayton Canal (Photo 7) extend through the Project site. The Contra Costa Canal is part of the Bureau of Reclamation's California Central Valley Project (CCVP). The canal diverts Sacramento-San Joaquin Delta water and sends the water as far as Martinez. The water is used for both agricultural and municipal purposes. The Contra Costa Canal loops through the northwest section of the site. The north end of the Clayton Canal begins on site from an aqueduct connected to the east side of the Contra Costa Canal, extending south where it exits the central portion of the site.



Photo 7. Clayton Canal.

Ponds

The site includes several small ephemeral stock ponds, watering holes, and seepage ponds (Photo 8). The majority of these water features are located in the Los Medanos Hills where natural water sources are scarce. The water levels in the ponds fluctuate seasonally. Levels are highest in the winter because of runoff, and they gradually dry out during the summer. The only identified perennial "natural" pond is the Cistern Pond; the upper Indian Springs pond has been reported to be perennial (Downard et al. 1999; Navy 2006), but it contained no water in March 2009 (City of Concord 2010). The vegetative components of the Cistern Pond have been described above under freshwater marsh habitat.

3.11.2 Wildlife

The seasonal drainages that flow out of the Los Medanos Hills convey flow ephemerally or intermittently, and thus do not support fish. Although amphibians such as red-legged frogs likely use these features as moist refugia during dispersal, and may disperse along these drainages during the wet season, they do not provide high-quality aquatic or wetland habitat aside from the ponds that are scattered among the drainages.

A number of ponds of varying size and hydrology are present on the Project site. Few of these ponds are perennial. The Cistern Pond provides water year-round, and as a result provides high-quality habitat for California red-legged frogs and western pond turtles, as well as foraging and nesting habitat for ducks and coots. The Indian Springs pond, reported by Downard et al. (1999) as perennial, did not contain water during H. T. Harvey & Associates' March 2009



Photo 8. Upper Cistern Pond.

field surveys (City of Concord 2010) or during field surveys conducted in March of 2015. Like most of the ponds on the site, this pond provides only seasonal surface water. The seasonal ponds on the site are nevertheless important breeding sites for California tiger salamanders, western toads, and Sierran chorus frogs, which in turn provide food for predators such as herons, egrets, belted kingfishers (*Megaceryle alcyon*), raccoons, and other species. Ducks, herons, and egrets forage within the Clayton Canal and Contra Costa Canal when these features hold water.

Section 4.0 Regulatory Setting

Biological resources on the Project site are regulated by a number of federal, state, and local laws and ordinances, as described below.

4.1 Federal Regulations

4.1.1 Clean Water Act

Areas meeting the regulatory definition of “waters of the U.S.” (jurisdictional waters) are subject to the jurisdiction of the USACE under provisions of Section 404 of the 1972 Clean Water Act (Federal Water Pollution Control Act) and Section 10 of the 1899 Rivers and Harbors Act (described below). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as “waters of the U.S.,” tributaries of waters otherwise defined as “waters of the U. S.,” the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to “waters of the U.S.” (33 CFR, Part 328, Section 328.3). Wetlands on non-agricultural lands are identified using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

Areas typically not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (33 CFR, Part 328).

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit will be effective in the absence of state water quality certification pursuant to Section 401 of the Clean Water Act. The State Water Resources Control Board (SWRCB) is the state agency together with the RWQCBs charged with implementing water quality certification in California.

Project Applicability. A delineation of wetlands and other waters on the Project site that are under the jurisdiction of the USACE was completed as part of the CRP-Area Plan California Environmental Quality Act (CEQA) review process (H. T. Harvey & Associates 2011b) and verified by the USACE in 2011 (USACE 2011). Any work within areas defined as waters of the U.S. (i.e., wetlands and other waters), may require a Section 404 fill discharge permit from the USACE and Section 401 Water Quality Certification from the RWQCB.

4.1.2 Federal Endangered Species Act

The federal Endangered Species Act (FESA) protects listed wildlife species from harm or “take” which is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as “take” even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under the FESA only if they occur on federal lands or if the project requires a federal action, such as a Clean Water Act Section 404 fill permit from the USACE.

The USFWS has jurisdiction over federally listed threatened and endangered wildlife species under the FESA, while the National Marine Fisheries Service (NMFS) has jurisdiction over federally listed, threatened and endangered, marine and anadromous fish.

Project Applicability. Federally listed animal species that are known or have the potential to occur on the Project site are the federally threatened California red-legged frog, California tiger salamander, and Alameda whipsnake. No federally listed plant species are known or reasonably expected to occur on the Project site.

4.1.3 Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA; 16 U.S.C., §703, Supp. I, 1989) prohibits killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The trustee agency that addresses issues related to the MBTA is the USFWS. Migratory birds protected under this law include all native birds and certain game birds (e.g., turkeys and pheasants; USFWS 2013). This act encompasses whole birds, parts of birds, and bird nests and eggs. The MBTA protects active nests from destruction and all nests of species protected by the MBTA, whether active or not, cannot be possessed. An active nest under the MBTA, as described by the Department of the Interior in its 16 April 2003 Migratory Bird Permit Memorandum, is one having eggs or young. Nest starts, prior to egg laying, are not protected from destruction.

Project Applicability. All native bird species occurring on the Project site are protected by the MBTA.

4.1.4 Federal Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Sec. 668 et seq.) makes it unlawful to import, export, take, sell, purchase, or barter any bald eagle (*Haliaeetus leucocephalus*) or golden eagle, or their parts, products, nests, or eggs. Take includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbance. Exceptions may be granted by the USFWS for scientific or exhibition use, or for traditional and cultural use by Native Americans. However, no permits may be issued for import, export, or commercial activities involving eagles.

Bald eagles and golden eagles are not known to nest at the maintenance sites or in fuel management areas. However, suitable wintering habitat is present around Lexington Reservoir, Lake Elzman, and Lake Williams for bald eagles. Golden eagles may occur at maintenance sites as a rare forager, and could potentially breed near fuel management areas.

4.2 State Regulations

4.2.1 Porter-Cologne Water Quality Control Act

The RWQCB is responsible for protecting surface, ground, and coastal waters within its boundaries, pursuant to the Porter-Cologne Water Quality Control Act of the California Water Code. The RWQCB has jurisdiction under Section 401 of the Clean Water Act for activities that could result in a discharge of dredged or fill material to a water body. Federal authority is exercised whenever a proposed project requires a Clean Water Act Section 404 permit from the USACE in the form of a Section 401 Water Quality Certification. State authority is exercised when a proposed project is not subject to federal authority, in the form of a Notice of Coverage, Waiver of Waste Discharge Requirements. Many wetlands fall into RWQCB jurisdiction, including some wetlands and waters that are not subject to USACE jurisdiction. RWQCB jurisdiction of other waters, such as streams and lakes, extends to all areas below the ordinary high water mark.

Under the Porter-Cologne Water Quality Control Act, the SWRCB and the nine regional boards also have the responsibility of granting Clean Water Act National Pollutant Discharge Elimination System (NPDES) permits and waste discharge requirements for certain point-source and non-point discharges to waters. These regulations limit impacts on aquatic and riparian habitats from a variety of urban sources.

Project Applicability. As stated above, any activities within the Project site that impact waters of the U.S./State will require 401 Certification and/or a Waste Discharge Requirement from the RWQCB. Within the Project site, drainages and wetlands that are considered waters of the U.S. are also considered waters of the State, and it is possible that some features, such as isolated wetlands, that may not be considered waters of the U.S. will be regulated by the RWQCB as waters of the State.

4.2.2 California Endangered Species Act

The California Endangered Species Act (CESA; Fish and Game Code of California, Chapter 1.5, Sections 2050-2116) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with the CESA, the CDFW has jurisdiction over state-listed species. The CDFW regulates activities that may result in “take” of individuals listed under the Act (i.e., “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”). Habitat degradation or modification is not expressly included in the definition of “take” under the Fish and Game Code. The CDFW, however, has interpreted “take” to include the “killing of a member of a species which is the proximate result of habitat modification.”

Project Applicability. State listed animal species that are known or have the potential to occur on the Project site are the state endangered California tiger salamander and the state threatened Alameda whipsnake, bald eagle (*Haliaeetus leucocephalus*), and American peregrine falcon (*Falco peregrinus anatum*). No state listed plant species are known or reasonably expected to occur on the Project site.

4.2.3 California Environmental Quality Act

The CEQA and the CEQA Guidelines provide guidance in evaluating impacts of projects on biological resources and determining which impacts will be significant. CEQA defines “significant effect on the environment” as “a substantial adverse change in the physical conditions which exist in the area affected by the proposed project.” Under CEQA Guidelines Section 15065, a project's effects on biotic resources are deemed significant where the project would:

- “substantially reduce the habitat of a fish or wildlife species”
- “cause a fish or wildlife population to drop below self-sustaining levels”
- “threaten to eliminate a plant or animal community”
- “reduce the number or restrict the range of a rare or endangered plant or animal”

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of the CEQA Guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would:

- “have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and or U.S. Fish and Wildlife Service”
- “have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service”
- “have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act”
- “interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites”
- “conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance”

- “conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan”

Section 15380(b) of the CEQA Guidelines provides that a species not listed on the federal or state lists of protected species may be considered rare if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions in the FESA and the CESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW or species that are locally or regionally rare.

The CDFW has produced three lists (amphibians and reptiles, birds, and mammals) of “species of special concern” that serve as “watch lists”. Species on these lists are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review as potential rare species, but do not have specific statutory protection. All potentially rare or sensitive species, or habitats capable of supporting rare species, are considered for environmental review per the CEQA §15380(b).

The CNPS, a non-governmental conservation organization, has developed a California rare plant ranking (CRPR) system species of concern. Vascular plants included on these lists are defined as follows:

- Rank 1A Plants presumed extirpated in California and either rare or extinct elsewhere.
- Rank 1B Plants rare, threatened, or endangered in California and elsewhere.
- Rank 2A Plants are presumed extirpated in California, but common elsewhere.
- Rank 2B Plants rare, threatened, or endangered in California, but more common elsewhere.
- Rank 3 Plants about which more information is needed – a review list.
- Rank 4 Plants of limited distribution – a watch list.

These CRPR threat ranks are further described by the following threat code extensions:

- 0.1 — seriously threatened in California;
- 0.2 — moderately threatened in California;
- 0.3 — not very threatened in California.

Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants appearing in Rank 1 or Rank 2 are, in general, considered to meet the CEQA's Section 15380 criteria, and adverse effects to these species may be considered significant. Impacts on plants that are listed by the CNPS on Rank 3 or Rank 4 are also considered during CEQA review, although because these species are typically not as rare as those on Rank 1 or Rank 2, impacts on them are less frequently considered significant.

Project Applicability. All impacts on biological resources will be considered during CEQA review of the Concord Hills Regional Park Project in the context of this EIR.

4.2.4 California Fish and Game Code

The California Fish and Game Code includes regulations governing the use of, or impacts on, many of the state's fish, wildlife, and sensitive habitats. The CDFW exerts jurisdiction over the bed and banks of rivers, lakes, and streams according to provisions of §§1601–1603 of the Fish and Game Code. The Fish and Game Code requires a Streambed Alteration Agreement for the fill or removal of material within the bed and banks of a watercourse or water body and for the removal of riparian vegetation.

Certain sections of the Fish and Game Code describe regulations pertaining to certain wildlife species. For example, Fish and Game Code §§3503, 2513, and 3800 (and other sections and subsections) protect native birds, including their nests and eggs, from all forms of take. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by the CDFW. Raptors (i.e., eagles, falcons, hawks, and owls) and their nests are specifically protected in California under Fish and Game Code §3503.5. Section 3503.5 states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Non-game mammals are protected by Fish and Game Code §4150, and other sections of the Code protect other taxa.

Project Applicability. Any work within channels with a clearly defined bed and banks on the Project site will require a Streambed Alteration Agreement from the CDFW per §1602 of the Fish and Game Code. All native bird species that occur on the Project site are protected by the state Fish and Game Code. Projects may be required to take measures to avoid impacts to nesting birds per Fish and Game Code §§3503, 3513, and 3800. Native mammals and other species on the Project site are also protected by the Fish and Game Code, and measures may be required to avoid and minimize impacts to these species during construction activities.

4.3 Local Regulations

4.3.1 City of Concord Tree Preservation and Protection Ordinance

The City of Concord Tree Preservation and Protection Ordinance (Chapter 18.310 of the Concord Municipal Code) serves to protect large native trees, trees of historic or cultural significance, groves and stands of mature trees, and mature trees in general. Protected trees may occur in any zoning district. Protected trees are

defined in Chapter 18.310.020 and include (1) any of the following listed native trees with a diameter of 12 inches or more as measured 54 inches above the ground (e.g., diameter at breast height) or a multi-stemmed native tree on the list below where the sum of all stem diameters is 12 inches or more as measured 54 inches above the ground: valley oak, blue oak, coast live oak, California bay (*Umbellularia californica*), California buckeye, and California sycamore (*Platanus racemosa*); (2) other trees with a diameter of 24 inches or more as measured 54 inches above the ground or more or a multi-stemmed nonnative tree where the sum of all stem diameters is 24 inches or more as measured 54 inches above the ground; (3) any tree which has been previously designated as a heritage tree by planning commission resolution; (4) a tree required to be planted, relocated, or preserved as a condition of approval of a tree permit or other discretionary permit, and/or as environmental mitigation for a discretionary permit; and (5) a tree with a trunk diameter of six inches or more or one component trunk of a multi-stemmed tree with a diameter of four inches or more as measured 54 inches above the ground that is located within the structure setback of creeks or streams as defined in Concord Development Code 18.305.040(A) (Structure Setbacks for Unimproved Channels).

A tree removal permit is required for the removal or relocation of any protected tree in all zoning districts when the removal or relocation is associated with a proposal requiring a planning permit pursuant to the Concord Development Code.

Project Applicability. A number of trees on the Project site may meet the definition of a protected tree. Any work within the Project site that will result in the removal of a protected tree must obtain a tree removal permit from the City of Concord.

Section 5.0 Special-Status Species and Sensitive Habitats

CEQA requires assessment of the effects of a project on species that are “threatened, rare, or endangered”; such species are typically described as “special-status species”. In order to assess the impacts of the Concord Hills Regional Park Project, special-status species have been defined as described below. Impacts on these species are regulated by some of the federal, state, and local laws and ordinances described under “Regulatory Setting” above.

5.1 Special-Status Plants

For purposes of this report, “special-status” plants are considered vascular or non-vascular plant species and lichens that are:

- Listed under the FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under the CESA as threatened, endangered, rare, or a candidate species.
- Listed by the CNPS as rare or endangered with CRPR 1A, 1B, 2A, or 2B.
- Listed by the CNPS as CRPR 3 or 4.

Several general plant surveys have failed to detect any special-status plants on the Project site (Jones and Stokes 1982; Downard et al. 1999). Species-specific or multiple-season botanical surveys for special-status plants that may occur at the site were conducted by Vollmar Consulting during the spring and summer of 2008. Several rounds of protocol-level surveys, corresponding to early, peak, and late special-status plant flowering periods, were conducted. The surveys assessed the overall geomorphic plant community characteristics and described sensitive habitats and the occurrence of special-status plants and noxious weeds. All surveys were floristic in nature and were conducted using an “intuitive controlled” approach, whereby the entire site was surveyed, with more focused efforts in those microhabitats with higher potential to support special-status plants (Vollmar Consulting 2008).

No occurrences of any plants meeting the definition of special-status plants provided above were documented on the Project site. The Vollmar Consulting (2008) study concludes that the lack of special-status plants is most likely due to the high level of disturbance the site has experienced and the absence of unique or specialized microhabitats preferred by many such species. Vollmar Consulting (2008) raised the possibility that the lack of special-status plants could have been influenced by the unusually dry spring season of 2008. Of the special-status plants with suitable habitat present on the Project site, Vollmar (2008) concluded that the growth of three species—big tarplant (*Blepharizonia plumosa*), round-leaved filaree (*California macrophylla*), and Contra Costa goldfields (*Lasthenia conjugens*)—may have been negatively influenced by the relatively dry spring, and it could not conclude absence because of the relatively dry winter. After monitoring the site’s hydrology during the winter and spring of 2008–2009 (a season of slightly below-average rainfall), H.T.

Harvey & Associates concluded that vernal pool habitats are not present on the site, and as such, suitable habitat for the Contra Costa goldfields does not occur on the Project site (City of Concord 2010).

During preparation of the CRP-Area Plan EIR, H. T. Harvey & Associates developed a list of 71 special-status plants thought to have some potential for occurrence on the CRP-Area Plan area. The list was compiled using CNPS lists and CNDDDB records as well as reports of earlier surveys conducted on the site. Of the 71 different plant species considered for potential occurrence, habitat for many of these species is entirely absent (i.e., specialized habitats such as tidal marsh, or saline-alkali or serpentine soils). Additional field surveys conducted by H.T. Harvey & Associates in the spring of 2009 failed to locate any populations of special-status plants or habitats having unique hydrologic or edaphic characteristics capable of supporting many of the potential special-status species. Additionally, after monitoring the site's hydrology during the winter and spring of 2008–2009 (a season of slightly below-average rainfall), H.T. Harvey & Associates concluded that vernal pool habitats are not present on the site, and as such, suitable habitat for the Contra Costa goldfields does not occur on the Project site. The remainder of the special-status plants (42 species) for which suitable habitat was determined to be present, were included in the survey efforts by Vollmar Consulting (2008).

As a result of the negative findings of prior investigations into the potential occurrence of special-status plants on the site, results of the protocol-level field surveys conducted by Vollmar Consulting (2008), and results of the additional field surveys conducted by H.T. Harvey & Associates in 2009 (City of Concord 2010), none of the special-status plants for which suitable habitat was determined to be on the site are considered present at this time, with the possible exception of the big tarplant and round-leaved filaree. The germination and growth of these two species may have been negatively affected by the rainfall amount and distribution experienced on the site during the rainfall year of 2007–2008; thus, conclusive statements regarding their absence cannot be made at this time. A detailed description of each of these species, including their potential to occur on the Project site, is provided below.

Big tarplant (*Blepharizonia plumosa*). **Federal Listing Status: None; State Listing Status: None; CRPR List: 1B.1.** Big tarplant is an annual herb in the sunflower family (*Asteraceae*) that blooms from July through October. This plant grows on dry, grassy slopes in valley and foothill grassland habitat at elevations between 98 and 1657 ft (CNPS 2015). Big tarplant is known from Alameda, Contra Costa, San Joaquin, San Luis Obispo, and Stanislaus counties. It is extirpated from its historic range in Solano County. Most historic occurrences were probably extirpated by agriculture and non-native plants. Grasslands within the Project site provide suitable habitat for this species.

Round-leaved filaree (*California macrophylla*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.1.** Round-leaved filaree is an annual herb in the geranium (*Geraniaceae*) family that blooms from March through May. This species occurs on clay soils in valley and foothill grassland or open cismontane woodland habitats at elevations from 49 to 3937 ft. It occurs in 92 USGS 7.5-minute quadrangles throughout the state in Alameda, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Lake, Lassen, Los

Angeles, Merced, Monterey, Napa, Riverside, Santa Barbara, San Benito, Santa Clara, San Diego, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, Stanislaus, Tehama, Ventura, and Yolo counties, and within habitats from Oregon to Baja California. It is considered extirpated from Butte County and from Santa Cruz Island. Grasslands within the Project site provide suitable habitat for this species.

5.2 Special-Status Animals

The legal status and potential for occurrence of special-status wildlife species known to occur or potentially occurring in the general vicinity of the Project site are given in Table 3. For the purposes of this report, the general vicinity of the Project is defined as the area within a 5-mi radius. Expanded descriptions are provided in Appendix A for those species for which potentially suitable breeding habitat occurs on the Project site, as well as species for which resource agencies have expressed particular concern and for which expanded discussion is required.

Several special-status wildlife species were determined to be absent from the Project site due to a lack of suitable habitat or to evidence that the species does not occur in the Project vicinity. Species considered for occurrence but rejected, as well as the reasons for their rejection, are included in Table 3. Several special-status species occur on the Project site as nonbreeding transients, foragers, or migrants, but they do not breed in or very close to the Project site and suitable nesting/breeding habitat is absent on the Project site. These species are the bald eagle, American peregrine falcon, northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammens*), long-eared owl (*Asio otus*), Vaux's swift (*Chaetura vauxi*), olive-sided flycatcher (*Contopus cooperi*), yellow warbler (*Setophaga petechia*), grasshopper sparrow (*Ammodramus savannarum*), Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), tricolored-blackbird (*Agelaius tricolor*), and western red bat (*Lasiurus blossevillii*). Because the short-eared owl, long-eared owl, Vaux's swift, olive-sided flycatcher, yellow warbler, grasshopper sparrow, and tricolored blackbird are only considered a species of special concern when nesting (Shuford and Gardali 2008), they are not considered a special-status species when they occur as a nonbreeding visitor to the Project site.

Thirteen special-status wildlife species are known or expected to occur within the habitats present on the Project site and could potentially breed or roost there. These are the California tiger salamander, California red-legged frog, Alameda whipsnake, western pond turtle, coast horned-lizard (*Phrynosoma coronatum frontale*), burrowing owl, golden eagle, white-tailed kite, loggerhead shrike, San Francisco common yellowthroat, American badger (*Taxidea taxus*), pallid bat, and Townsend's big-eared bat (*Corynorhinus townsendii*).

5.3 Sensitive and Regulated Plant Communities and Habitats

The CDFW ranks certain rare or threatened plant communities, such as wetlands, meadows, and riparian forest and scrub, as 'threatened' or 'very threatened'. These communities are tracked in the CNDDDB. Impacts on CDFW sensitive plant communities, or any such community identified in local or regional plans, policies, and regulations, must be considered and evaluated under the CEQA (California Code of Regulations: Title

Table 3. Special-status Wildlife Species, Their Status, and Potential Occurrence on the Project Site

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Federal or State Endangered, Threatened, or Candidate Species			
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT	Grassy or mud-bottomed swales, earth slump, or basalt-flow depression pools in grasslands.	Absent. No known records on the Project site or in the general vicinity. Protocol-level dry-season and wet-season surveys conducted in 2007 and 2008 throughout the CNWS did not detect the species (EDAW 2008b).
Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	FE	Grass or mud-bottomed swales in grasslands on old alluvial soils underlain by hardpan.	Absent. No known records on the Project site or in the general vicinity. Protocol-level dry-season and wet-season surveys conducted in 2007 and 2008 throughout the CNWS did not detect the species (EDAW 2008b).
Longhorn fairy shrimp (<i>Branchinecta longiantenna</i>)	FE	Vernal pools with clear to turbid water in grass-bottomed pools and clear-water sandstone depression pools.	Absent. No known records on the Project site or in the general vicinity. Protocol-level dry-season and wet-season surveys conducted in 2007 and 2008 throughout the CNWS did not detect the species (EDAW 2008b).
Green sturgeon (<i>Acipenser medirostris</i>)	FT, CSSC	Spawns in large river systems such as the Sacramento River; forages in nearshore oceanic waters, bays, and estuaries.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.
Central California Coast coho salmon (<i>Oncorhynchus kisutch</i>)	FE, SE	Prefer short lower sections of the larger coastal drainages. Requires adequate stream flows, water temperature, depths, and velocities, and appropriate spawning and rearing gravels and availability of instream cover and food.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Central California Coast steelhead Distinct Population Segment (DPS) (<i>Oncorhynchus mykiss</i>)	FT	Cool streams with suitable spawning habitat (i.e., clean gravels) and conditions allowing migration between spawning and marine habitats.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.
Central Valley steelhead DPS (<i>Oncorhynchus mykiss</i>)	FT	Spawns in cool, moderately fast flowing water with gravel bottom.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.
Central Valley spring-run Chinook salmon Evolutionarily Significant Unit (ESU) (<i>Oncorhynchus tshawytscha</i>)	FT, ST	Spawn and rear in main-stem Sacramento River and suitable perennial tributaries. Require cool year-round water temperatures and deep pools for over-summering habitat. Spawn in riffles with gravel and cobble substrate.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.
Winter-run Chinook salmon, Sacramento River ESU (<i>Oncorhynchus tshawytscha</i>)	FE, SE	Cool streams that reach the ocean and that have shallow, partly shaded pools and clear-water sandstone depression pools.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.
Longfin smelt (<i>Spirinchus thaleichthys</i>)	ST	Spawns in fresh water in the upper end of the San Francisco Bay; occurs year-round in the South Bay. When not spawning, most abundant where salinity generally ranges from 2 to 20 parts per thousand.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows).

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Delta smelt (<i>Hypomesus transpacificus</i>)	FT, SE	Estuarine systems in the Sacramento-San Joaquin Delta. Most spawning occurs in tidally influenced backwater sloughs and channel edgewater.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows).
Tidewater goby (<i>Eucyclogobius newberryi</i>)	FE, CSSC	Brackish water habitats along coast, fairly still but not stagnant water, and high oxygen levels.	Absent. Aquatic habitats on the Project site are entirely freshwater and are thus not suitable for this species.
California tiger salamander (<i>Ambystoma californiense</i>)	FT, SE	Vernal or temporary pools in annual grasslands or open woodlands.	Present. Tiger salamanders have been recorded breeding at the Cistern Pond, Rock Quarry Pond, 5AT-1 Pond and adjoining marsh, 5AT-2 Pond, Rattlesnake Canyon Pond, lower Indian Springs Pond, north and south Hilltop Ponds, and other pools on the Project site (Figure 5). In addition, based on the results of a habitat assessment conducted by EDAW (2008a), the Project site includes 1655 acres of high-quality tiger salamander upland habitat and 700 acres of medium-quality upland habitat.
California red-legged frog (<i>Rana draytonii</i>)	FT, CSSC	Streams, freshwater pools, and ponds with emergent or overhanging vegetation.	Present. Breeding by California red-legged frogs has been documented on the Project site at the Cistern Pond, upper and lower Indian Springs, Rattlesnake Canyon Pond, 5AT-1 Marsh, and 5AT-2 Pond and Lower Marsh (Figure 5). In addition, approximately 2511 acres of the approximately 2626-acre Project site (i.e., all but the developed portions) provide refugial, aquatic breeding and non-breeding, and/or dispersal habitat for the red-legged frog. As noted by Downard et al. (1999), the hydrology of the Cistern Pond and Indian Springs is linked and individual red-legged frogs likely disperse between these features, as evidenced by observations of red-legged frogs along dirt roads between Cistern Pond and Indian Springs.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Alameda whipsnake (<i>Masticophis lateralis euryxanthus</i>)	FT, ST	Inhabits chaparral and scrub habitats, especially those with rock outcrops. May also use adjacent oak woodland, grassland, riparian, and evergreen forest, usually within 500 ft of high-quality scrub.	<p>May be Present. A whipsnake reported from the Tidal Area of the CNWS during the 1998-1999 surveys (Downard et al., 1999) is the only report from the Project vicinity. However, this observation was made in an area of extensive wetlands rather than in habitat typically used by Alameda whipsnakes, and there is a reasonable probability that this individual was a misidentified aquatic garter snake (<i>Thamnophis atratus</i>) (Ecology & Environment and Swaim Biological 2008). The closest verified records are from Black Diamond Mines Regional Preserve, 4 mi southeast of the site. The nearest high-quality habitat for whipsnakes is 1.5 to 2.0 mi south of the site on the slope of Mt. Diablo (Contra Costa County 2006).</p> <p>A habitat assessment performed by Ecology & Environment and Swaim Biological (2008) determined that the lack of extensive scrub, short-grazed nature of the grassland, and distance from potential source populations reduce the quality of habitat on the site for this species. However, potential habitat was determined to be present in the small patches of sage scrub in upper Rattlesnake Canyon and in grassland with rock outcrops in the areas southeast and just northwest of Bailey Road. There is a low probability that this species would disperse into portions of the site farther to the northwest.</p>
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SE	Nests in tall trees, and occasionally on cliffs and electrical towers, usually near large water bodies. Typically forages in and near such water bodies, but may also feed in grassland or other open habitats.	<p>Absent as Breeder. Although individuals may occasionally forage on the Project site (a juvenile bald eagle was observed during spring surveys in 1982 [Jones and Stokes 1982]), the species is not known or expected to breed, occur regularly, or occur in large numbers on the site. It has not been recorded on the CNWS in any of the 11 years of the Central Contra Costa County Christmas Bird Count for which data were provided (Mount Diablo Audubon Society, unpublished).</p>
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SE, SP	Nests on cliffs, and occasionally on buildings or bridges; forages for birds over many habitats.	<p>Absent as Breeder. Forages on the Project site infrequently and in low numbers during migration and winter. Single individuals have been recorded on the CNWS during five of the 11 years of the Central Contra Costa County Christmas Bird Count for which data were provided (Mount Diablo Audubon Society, unpublished). There is no suitable nesting habitat on the Project site and the species is not expected to breed, occur frequently, or occur in large numbers on the site.</p>

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Least Bell's vireo (<i>Vireo bellii pusillus</i>)	FE, SE	Typically, nests in willow and cottonwood- dominated riparian habitat.	Absent. The Project site is outside the species' known historical and current breeding range. Although the species formerly may have bred north to Redding in the Central Valley, there is no evidence that it historically bred in the Project vicinity, as southern Santa Clara County was the northern limit of the species' historical breeding range west of the Central Valley. Riparian habitat on and immediately adjacent to the site is not suitable for the species due to its narrow extent, fragmented nature, and poorly developed understory (largely due to grazing) (Ecology and Environment 2008). Protocol-level surveys conducted on the CNWS in spring and summer 2009 not detect the species, confirming that it is absent from the site (Ecology and Environment and Foothill Associates 2009).
San Joaquin kit fox (<i>Vulpes macrotis mutica</i>)	FE, ST	Flat or gently sloping grasslands on the margins of the San Joaquin Valley and adjacent valleys.	Absent. There are no records from the Project site (CNDDDB 2015). This species was reported in 1996 and 1997 at Black Diamond Mine Regional Preserve, approximately 3 mi southeast of the site (CNDDDB 2015). The 1982 survey of the CNWS did not detect kit fox and concluded that their occurrence is highly improbable based on data available at the time. The kit fox was determined to be absent from the adjacent property at Bailey Road Estates (Mills Associates 2005). The ECCC HCP/NCCP noted that a recent survey of Contra Costa County and Alameda County within the known range of the San Joaquin kit fox using detection dogs found no evidence of recent occupancy (Smith et al. 2006). Based on the lack of any records of the kit fox from the Project site and its vicinity, coupled with the absence of recent records from other areas in adjoining areas of Contra Costa County, this species is determined to be absent from the site.
California Species of Special Concern			
Central Valley fall-run/late fall-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	CSSC	Spawns in cool portions in the mainstem Sacramento River and some tributaries, as well as some South San Francisco Bay streams, during the later summer and fall months.	Absent. No streams are present on the Project site. Further, the species is not expected to occur in Mt. Diablo Creek along the Project's southern border due to barriers to fish migration (such as a utility berm near Clyde that completely blocks lower Mt. Diablo Creek, downstream of the site, except during very high flows), and the absence of the species during surveys.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Foothill yellow-legged frog (<i>Rana boylei</i>)	CSSC	Partially shaded shallow streams and riffles with a rocky substrate and perennial flow.	Absent. No records from the Project site or vicinity. According to the ECCC HCP/NCCP (Contra Costa County 2006), all known extant occurrences of this species in the county are around Mt. Diablo. This species is most frequently associated with large streams having substantial flow over and around cobbles; such conditions are absent from the site. The reach of Mt. Diablo Creek adjacent to the Project site does not provide suitable breeding habitat due to the absence of flow for most of the year and absence of cobble substrate. Even if the species is present in the upper part of the Mt. Diablo Creek watershed (which has not been demonstrated), it is unlikely to disperse through the urbanized reaches upstream to be able to reach the Project site.
Western pond turtle (<i>Actinemys marmorata</i>)	CSSC	Permanent or nearly permanent water in a variety of habitats, breeds in upland areas.	Present. Within the Project site, this species has been observed only at the Cistern Pond (CNDDDB 2015), and only in small numbers. Small numbers may nest in uplands near the Cistern Pond, and possibly elsewhere on the site.
Silvery legless lizard (<i>Anniella pulchra pulchra</i>)	CSSC	Occurs in sandy or loose loamy soils in a variety of habitats	Absent. Suitable habitat is absent from the Project site due to the absence of loose soils. The nearest known occurrence is approximately 12 miles east of the site (CNDDDB 2015), and the closest areas of potential habitat occur more than 10 mi to the east and 4 mi to the southeast of the site according to the ECCC HCP/NCCP (Contra Costa County 2006).
Coast horned lizard (<i>Phrynosoma coronatum frontale</i>)	CSSC	Sandy soils, usually in dry creek channels or coastal dunes.	May be Present. A single individual reported by Kuenzi and Morrison (1994, as cited in Downard et al. 1999) on the Inland Area of the CNWS represents the only record for the CNWS. This species is typically associated with loose, often sandy soils, which are completely absent from the Project site. The location of the 1994 report is unknown, but the most likely area of occurrence is in the area southeast of Bailey Road, within the Project site.
Western spadefoot (<i>Spea hammondi</i>)	CSSC	Breeds in temporary rain pools; spends much of life in burrows or cracks in hard soil.	Absent. Project site is not within the species' known range and there are no records from the Project site or vicinity, despite intensive surveys of the seasonal pools present on the Inland CNWS. Determined to be absent.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Northern harrier (<i>Circus cyaneus</i>)	CSSC	Nests in extensive marshes and wet fields, forages in marshes, grasslands, and ruderal habitats.	Absent as Breeder. Individual harriers have been frequently observed on the Project site during general natural resource surveys (Jones and Stokes 1982, Downard et al. 1999). This species forages commonly in grassland on the Project site, but it is expected to occur here primarily, or solely, as a nonbreeding forager, as the grasslands on the site do not provide enough protection from mammalian predators to provide high-quality nesting habitat for this species.
Burrowing owl (<i>Athene cunicularia</i>)	CSSC	Open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels.	Present. Burrowing owls have been observed in small numbers within grassland on the Project site. An individual was observed in the southeastern portion of the Project site in 1981–1982 (Jones and Stokes 1982). A burrowing owl was detected on the Project site in the area southeast of Bailey Road during site visits in 2007 (CH2M HILL 2007), but none were seen during general field surveys conducted throughout the site by H. T. Harvey & Associates between November 2008 and June 2009 (City of Concord 2010). Short grassland with abundant ground squirrel burrows is present throughout much of the Project site, providing ostensibly high-quality habitat for burrowing owls. However, the results of surveys of the site have consistently demonstrated this species to be present only in small numbers, and primarily during the nonbreeding season. If it breeds on the site, it does so only in very low numbers.
Short-eared owl (<i>Asio flammeus</i>)	CSSC (breeding)	Breeds in extensive marshes and moist grasslands, forages over wetlands, grasslands, and ruderal habitats.	Absent as Breeder. Short-eared owls have not been documented on the Project site (Downard et al. 1999), but the extensive grasslands provide suitable foraging habitat. If short-eared owls are present on the site, they are expected to occur only as infrequent nonbreeding foragers, as the grasslands do not provide enough protection from mammalian predators to provide suitable nesting habitat for this species.
Long-eared owl (<i>Asio otus</i>)	CSSC (breeding)	Nests in chimneys and in hollow snags in evergreen forests.	Absent as Breeder. A single individual recorded in a pine plantation during the Central Contra Costa County Christmas Bird Count in 2003 (Mount Diablo Audubon Society, unpublished) is the only record from the CNWS. This species likely occurs only as a rare and irregular nonbreeding visitor, and it is not expected to nest on the site, to occur regularly, or to occur in large numbers.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Vaux's swift (<i>Chaetura vauxi</i>)	CSSC (nesting)	Nests in snags in coastal coniferous forests or, occasionally, in chimneys; forages aerially.	Absent as Breeder. Nonbreeding individuals forage over the Project site, primarily during migration. However, suitable breeding habitat is absent, and the species does not breed here.
Olive-sided flycatcher (<i>Contopus cooperi</i>)	CSSC (breeding)	Nests in montane forests.	Absent as Breeder. Expected to occur on the Project site only as an infrequent nonbreeding forager during migration. Not expected to breed, occur regularly, or occur in large numbers on the site, as suitable breeding habitat is not present.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	Present. This species has been observed regularly and fairly commonly in grasslands during biological surveys of the site (Navy 2006) and suitable breeding and foraging habitat is present.
Yellow warbler (<i>Setophaga petechia</i>)	CSSC (nesting)	Nests in riparian woodlands.	Absent as Breeder. The riparian habitat on the site is extremely limited and is of low quality for the yellow warbler due to understory degradation (likely resulting from grazing). This species has not been recorded breeding, or even summering, on the Project site or the larger Inland CNWS. However, it is a common migrant, particularly in fall, and may occur on the Project site during migration.
San Francisco common yellowthroat (<i>Geothlypis trichas sinuosa</i>)	CSSC	Nests in tall, emergent, herbaceous wetlands.	May be Present. Small numbers of San Francisco common yellowthroats nest in the Project vicinity (Downard et al. 1999) and the species may nest and forage in freshwater marsh and in emergent vegetation and other wetland vegetation on the Project site.
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	CSSC (breeding)	Breeds and forages in meadows, fallow fields, and pastures.	Absent as Breeder. May occur as a migrant in grasslands on the Project site but this species is not known or expected to breed, occur regularly, or occur in large numbers on the Project site.
Bryant's savannah sparrow (<i>Passerculus sandwichensis alaudinus</i>)	CSSC	Breeds and forages in meadows, fallow fields, pastures, and salt marshes.	Absent as Breeder. Savannah sparrows (of unknown subspecies) forage commonly in grasslands on the Project site during the nonbreeding season, but they are not expected to breed here.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Suisun song sparrow (<i>Melospiza melodia maxillaris</i>)	CSSC	Tidal salt and brackish marsh around Suisun Bay.	Absent. Song sparrows breed on the Project site in riparian and freshwater marsh habitat, and Suisun song sparrows have been reported on the CNWS. However, due to the habitat associations of <i>maxillaris</i> (tidal salt and brackish marsh) vs. <i>gouldii</i> , which is the common, widespread subspecies breeding in nontidal and freshwater habitats throughout the San Francisco Bay area, it is likely that all song sparrows occurring on the Project site represent <i>gouldii</i> . Therefore, <i>maxillaris</i> is presumed absent from the Project site.
Tricolored blackbird (<i>Agelaius tricolor</i>)	CSSC (breeding)	Nests near fresh water in dense emergent vegetation, forages in a variety of open habitats.	Absent as Breeder. Approximately 100 tricolored blackbirds were observed by H. T. Harvey & Associates in a large flock of mixed blackbird species foraging in grassland on the Project site in March 2009 (City of Concord 2010). The only freshwater marsh habitat on the site potentially extensive enough to support breeding by this species is at the Cistern Pond, but no breeding activity has been observed there. Likely occurs only as an occasional nonbreeder.
American badger (<i>Taxidea taxus</i>)	CSSC	Typically associated with extensive grasslands containing small mammal prey, but will use other open and scrub habitats.	May be Present. Although several burrows in upland grasslands were identified that exhibited characteristics of typical badger burrows (e.g., elliptical) during the multi-season University of Arizona study, only a single badger was observed on the CNWS, a dead individual along Kinne Boulevard (Downard et al. 1999). Downard et al. (1999) also cited a badger recorded by the Public Works Engineering Division (1980). Individuals may occasionally occur in grasslands on the Project site. However, based on the infrequency with which it has been recorded and the lack of observations of this species' distinctive dens during field surveys conducted by H. T. Harvey & Associates, this species is expected to occur infrequently and in low numbers.
San Francisco dusky-footed woodrat (<i>Neotoma fuscipes annectens</i>)	CSSC	Builds large stick nests in a variety of habitats, including riparian areas, oak woodlands, and scrub.	Absent. None of the intensive biological surveys of the CNWS, including the Project site, has recorded the presence of this species, and field surveys by H. T. Harvey & Associates did not detect any nests on the site. Thus, this species was determined to be absent.
Pallid bat (<i>Antrozous pallidus</i>)	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	May be Present. During the multi-season University of Arizona studies (Downard et al. 1999), bats were detected acoustically on the Project site at a pond at the base of Rattlesnake Canyon, freshwater marsh 5AT, and Indian Springs; however, the species of bat was not determined. Mist netting at Rattlesnake Canyon pond and Indian Springs captured no bats.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	CSSC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats.	May be Present. Although this species has not been recorded on the Project site, Downard et al. (1999) and Tetra Tech, Inc. (2002) concluded that it could occur here. Trees with cavities, and possibly old buildings or bunkers, provide potential roost sites, and this species may occur (and could possibly even form maternity roosts) on the site. An old mine in upper Rattlesnake Canyon could possibly provide a roost site as well.
Western red bat (<i>Lasiurus blossevillii</i>)	CSSC	Roosts in foliage in forest or woodlands, especially in or near riparian habitat.	Absent as Breeder. Although this species has not been recorded on the Project site, Downard et al. (1999) concluded that it could occur here. This species is not known or expected to breed on or near the site, but it could roost on the site in small numbers during migration or in winter.

State Fully Protected Species

Golden eagle (<i>Aquila chrysaetos</i>)	SP	Nests in tall trees or on cliffs, forages in grasslands and other open habitats.	Present. A pair of golden eagles has nested regularly in a eucalyptus grove located along the north-central boundary of the site (Eagle's Nest EOD Area) (Jones and Stokes 1982, Downard et al. 1999). This nest site, which has been active for a number of years, has been enclosed with fencing and posted by the Navy with information regarding the provisions of the Bald Eagle and Golden Eagle Protection Act. Additionally, several nesting pairs of golden eagles occur on East Bay Regional Park District (EBRPD) lands to the south of the site. Eagles from one or more of these nest sites regularly forage in grasslands on the site.
White-tailed kite (<i>Elanus leucurus</i>)	SP	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	Present. Pine and eucalyptus plantations and oak woodlands on the Project site provide suitable nesting habitat and the grasslands and other open habitats provide suitable foraging habitat throughout the site. The species has been recorded on the Project site (City of Concord 2010) and has been recorded breeding in the immediate vicinity (Downard et al. 1999).

*Status Codes:

FE = Federally listed Endangered

FT = Federally listed Threatened

SE = State listed Endangered

ST = State listed Threatened

CSSC = California Species of Special Concern

SP = State Fully Protected Species

14, Div. 6, Chap. 3, Appendix G). Furthermore, wetland and riparian habitats are also afforded protection under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the USACE, RWQCB, CDFW, and/or the USFWS.

Natural Communities of Special Concern. Based on a query of Rarefind (CNDDDB 2015) for sensitive habitats in the *Vine Hill, Walnut Creek, and Clayton, California* USGS 7.5-minute quadrangle in which the Project site occurs, no sensitive habitats were identified within the Project site.

Waters of the U.S./State. As discussed under *Regulatory Setting* above, a delineation of wetlands and other waters on the Project site that are under the jurisdiction of the USACE was completed as part of the CRP-Area Plan CEQA review process (H. T. Harvey & Associates 2011b) and verified by the USACE in 2011 (USACE 2011). In addition, it is possible that some features, such as isolated wetlands, that may not be considered waters of the U.S. will be regulated by the RWQCB as waters of the State.

CDFW Stream/Riparian Habitat. The bed and banks of the unnamed drainages on the Project site, as well as associated riparian habitat, are regulated by the CDFW per §1602 of the Fish and Game Code. Any work within the bed or banks of the unnamed drainages, or within adjacent riparian habitat, would require a Streambed Alteration Agreement from the CDFW.

5.4 Invasive Species

Since the exploration of California by Europeans began, people have brought non-native plants and animals into the Project area, either accidentally (e.g., as stowaways in cargo shipments) or intentionally (e.g., as pets or for food, ornament, or sport), and many of these species have been introduced into the wild. Introduced species that cause harm and, once established, spread quickly are often called “invasive” species. Invasive species can threaten the diversity and abundance of native species through predation, competition for resources, transmission of disease, parasitism, and physical or chemical alteration of the habitat.

A floristic survey of the Inland Area of the CNWS by Vollmar Consulting (2008) identified 75 non-native plant species listed on the California Invasive Plant Inventory (Cal-IPC 2015). Many of these species are present on the Project site, including medusahead (*Taeniatherum caput-medusae*), peppergrass (*Lepidium latifolium*), yellow-star thistle (*Centaurea solstitialis*), and fennel (*Foeniculum vulgare*), which have been rated as having “high” ecological impact and can invade into additional areas.

Introduced animal species are also present on the Project site. A few of the more common introduced/invasive wildlife species present in, or with a high potential to be introduced to, the Project site are discussed in more detail below.

The American bullfrog (*Lithobates catesbeianus*) has been accidentally and intentionally introduced (e.g., for food in the 1920s by commercial frog farmers) throughout the world and is now established throughout most

of California (California Herps 2015), including the Project site (Jones and Stokes 1982, Downard et al. 1999). Their large size, mobility, generalized eating habits (their prey includes native amphibians as well as other aquatic and riparian vertebrates [Graber 1996]).

Non-native species such as red foxes (*Vulpes vulpes*) and Norway rats, which have been documented on the CNWS (Downard et al. 1999), are significant predators of native birds. For example, Norway rats have long been known to be effective predators of California Ridgway's rail (*Rallus obsoletus obsoletus*) nests (DeGroot 1927, Harvey 1980, Foerster et al. 1990), and according to Harvey and Foerster et al., predators, especially rats, have accounted for California Ridgway's rail nest losses of 24 to 29 percent in certain South Bay marshes.

Section 6.0 Potential Conservation Measures

Based on the existing conditions on the Project site, the following conservation measures have been identified as potential measures avoiding and/or minimizing impacts on sensitive biological resources. Conservation measures will be refined and confirmed based on the proposed Project.

- All recreational facilities, including trails and roads, will maintain a buffer of at least 200 ft from the two small patches of coastal sage scrub in the upper part of Rattlesnake Canyon, as these patches represent the highest-quality habitat for Alameda whipsnakes on the site.
- Trails and roads will be sited to maintain a buffer of at least 100 ft from California red-legged frog and/or California tiger salamander aquatic breeding sites. All other recreational facilities (e.g., visitor center, parking lots, and picnic areas) will maintain a buffer of at least 300 ft from California red-legged frog and/or California tiger salamander breeding ponds due to the concentration of people at such facilities and the potential for generation of food waste (which may attract predators) at those facilities.
- No recreation-related development that would preclude movement of California red-legged frogs and/or California tiger salamanders between breeding areas, or for red-legged frogs between seasonal breeding ponds and the nearest perennial aquatic or riparian habitat, will be constructed.
- Roads within 300 ft of California red-legged frog and/or California tiger salamander breeding habitat will have a maximum speed limit of 20 miles per hour.
- A split rail fence or other symbolic “barrier” will be erected around California red-legged frog and/or California tiger salamander breeding sites to deter off-trail use of these aquatic habitats by park users. Fencing will be placed 75 ft from the aquatic habitat and will include signs informing visitors of the importance of protecting the listed species and habitats that occur at these locations.
- No lighting will be placed within or immediately adjacent to (within 200 ft of) known California red-legged frog and/or California tiger salamander breeding habitat.
- Consider limiting nighttime recreation to occasional interpretive and/or recreational activities. Further, consider limiting nighttime activities to periods when there is less than a 50 percent probability of rain (based on the nearest National Weather Service forecast).
- The EBRPD will prohibit collection of aquatic organisms within the Park and prohibit the release of aquatic organisms into any water body or waterway in the Park, without prior USFWS approval.
- To prevent disturbance or harassment of nesting golden eagles, the EBRPD will not construct, or open to the public, trails or other recreational features within 0.25 mile of the existing golden eagle nest unless the trail or facility is to be closed between 15 January and 1 August in years when the nest is active.
- Entrance points to existing roads, trails, and railroad tracks that are not designated as part of the Park facilities will be closed using signage, barriers (e.g., fencing or planted vegetation), and/or, mechanical removal and revegetation of the feature.
- The EBRPD will implement a litter and waste management program to effectively meet demand. Elements of this program will include staff outreach and public education, routine litter and nuisance

pickup and removal, and availability of sufficient waste containers. Waste containers will be designed in such a way that animals such as common ravens (*Corvus corax*) and raccoons (*Procyon lotor*), which are predators of special-status species, cannot remove the trash within.

- The EBRPD will prepare a long-term management plan for review and approval by the USFWS. The goals of which will include the following:
 - To enhance upland habitat in the Project Area so that it will provide high-quality dispersal and aestivation habitat for the California tiger salamander, and high-quality dispersal and foraging habitat for the California red-legged frog.
 - To enhance suitable breeding habitat in the Project Area for the California tiger salamander and California red-legged frog.
 - To manage and maintain the aquatic and grassland habitats in a manner that provides high-quality breeding, dispersal and aestivation habitat for the California tiger salamander.
 - To manage and maintain the aquatic and grassland habitats in a manner that provides high-quality breeding, foraging and dispersal habitat for the California red-legged frog.
- The long-term management plan will include a grazing management component. The primary goal of the grazing management plan will be to control the location, intensity, and timing of cattle grazing in uplands and around the ponds (by implementation of grazing management techniques) in order to maintain adequate residual dry matter and establish new emergent and upland vegetation to enhance conditions for these amphibians.
- The long-term management plan will include a California red-legged frog and California tiger salamander monitoring component. Monitoring will include periodic surveys for both species. The purpose of these surveys will be to document whether these species are breeding successfully in the Project Area and whether conditions in areas where breeding is occurring are appropriate for successful metamorphosis. The goal of the surveys will be to compare the relative abundance of California tiger salamander larvae and individuals and California red-legged frog egg masses and individuals between years to determine if an increasing or decreasing trend in population size or breeding attempts is occurring which will inform any adaptive management
- The long-term management plan will include a California red-legged frog and California tiger salamander breeding pond monitoring component. The purpose of the monitoring will be to determine if the ponds require any remedial measures to ensure the structural integrity of dams, berms, and/or spillways, and to initiate those actions.

Section 7.0 References

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7.2 Personal Communications

- Dr. Amy Kuenzi, Department of Biological Sciences, Montana Tech University. Emails to Steve Rottenborn, H.T. Harvey & Associates, May 28 and June 7, 2009.

Appendix A. Detailed Descriptions of Special-Status Wildlife Species Potentially Occurring on the Project Site

7.2.1 Federal or State Endangered and Threatened Species

California Tiger Salamander (*Ambystoma californiense*). Federal Listing Status: Threatened (Central Population); State Listing Status: Threatened. The California tiger salamander was listed as threatened in August 2004 (USFWS 2004), and critical habitat was designated in August 2005 (USFWS 2005a). However, critical habitat does not occur within or adjacent to the Project site. The range of the California tiger salamander is restricted to the Central Valley and the South Coast Range of California, from Butte County south to Santa Barbara County.

The California tiger salamander's preferred breeding habitat consists of temporary (minimum of 3-4 months), ponded environments (e.g., vernal pool, ephemeral pool, or human-made ponds) surrounded by uplands that support small mammal burrows. California tiger salamanders will also utilize permanent ponds provided aquatic, vertebrate predators are not present. Such ponds provide breeding and larval habitat, while burrows of small mammals such as California ground squirrels and valley pocket gophers in upland habitats provide refugia for juvenile and adult salamanders during the dry season.

California tiger salamanders avoid desiccation during the dry months of summer and autumn by taking refuge in burrows excavated by ground squirrels and other burrowing mammals. After autumn rains commence, they emerge and begin nocturnal migrations, congregating at breeding sites. Eggs are deposited singly or in small groups of 2 to 4 in relatively shallow water (Storer 1925, Twitty 1941). Following breeding, adults move away from ponds to upland refugia. Eggs hatch two to four weeks after deposition (Storer 1925, Twitty 1941), and a minimum of approximately 10 weeks is required to complete development through metamorphosis (Anderson 1968 and Feaver 1971, as cited in Jennings and Hayes 1994). Thus, aquatic breeding sites must retain water for a minimum of three months. Following metamorphosis, juveniles leave the drying ponds in late spring or summer and move at night to upland refugia. Juveniles and adults emerge from refugia on cool, moist, or foggy nights to feed on a wide variety of invertebrate and small vertebrate prey (Shaffer et al. 1993).

Studies of upland habitat use by California tiger salamanders (e.g., Austin and Shaffer 1992, Trenham et al. 2001, USFWS 2004, Trenham and Shaffer 2005, Orloff 2007) suggest that dispersal distances may vary among populations and/or sites, that California tiger salamander abundance likely decreases with increasing distance from a breeding pond, and that a few individuals may disperse up to 1.3 mi from breeding areas.

Within the Project site, California tiger salamanders are known to breed in a number of locations in the southeastern half of the site, including the Cistern Pond, Rock Quarry Pond, 5AT-1 Pond and adjoining marsh, 5AT-2 Pond, Rattlesnake Canyon Pond, lower Indian Springs Pond, north and south Hilltop Ponds, and other pools (Figure 5).

Resource surveys of the CNWS conducted from 1981 to 1982 (Jones and Stokes 1982) detected California tiger salamanders on the Project site. On two occasions, adults were captured during small mammal pit fall

trapping, in oak woodland habitat with rock outcrops in the 5AT area. In addition, during reptile and amphibian surveys, larvae were found in the Cistern Pond, a small seasonal pond next to the quarry, and in a seasonal pond north of the eagle's nest eucalyptus grove.

Downard et al. (1999) conducted surveys for amphibians and reptiles within all representative environments on the Tidal and Inland areas of the CNWS, but gave special attention to areas considered likely to harbor the California tiger salamander, including ephemeral pools, ponds, and freshwater marshes. Tiger salamanders were observed at nine of the 22 fixed survey locations. California tiger salamander individuals were observed from March to May and September to December. The greatest number of individuals was observed at the upper Cistern Pond and lower Indian Springs Pond. Tiger salamander eggs were also observed at these two locations. In addition, larvae and juveniles were observed at the Rock Quarry, 5AT-2 Pond, Rattlesnake Canyon Pond, and the Hilltop Ponds, with the greatest number of individuals being observed at the Hilltop Ponds.

Smallwood and Morrison (2007) conducted focused California tiger salamander larval surveys in spring of 2005 and 2006, years of above-average rainfall, and conducted upland sampling using drift fences and pitfall traps. They detected California tiger salamander larvae in the Cistern Pond, Upper Cistern Pond, south Hilltop Pond, north Hilltop ponds (east and west), 5AT-I Pond (southeast and northwest), 5AT-2 Pond, Rock Quarry Pond, and Indian Springs Pond, as well as in ditches by 5ATX60 and 5ATX 59, by the rail track near Bailey Road, and in 5 ATX 47 south and north.

A study conducted by EDAW (2008a) considered previously identified breeding locations, the distribution of small mammal burrows, potential impediments to dispersal, and information concerning this species' dispersal capabilities to evaluate various areas on the site according to their upland habitat value. This study ranked the relative value of various sections of the CRP-Area Plan area as upland habitat for California tiger salamanders based on proximity to known breeding ponds, abundance of upland refugia, and location relative to impediments such as Mt. Diablo Creek and Willow Pass Road. The study concluded that the southern and eastern portions of the study area (i.e., proposed Concord Hills Regional Park) are of the highest potential value as upland habitat for California tiger salamander populations in in the Action Area. The Project site includes approximately 1655 acres of high-quality tiger salamander upland habitat and 700 acres of medium-quality upland habitat (EDAW 2008a).

California Red-legged Frog (*Rana draytonii*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern. The California red-legged frog was listed as threatened in June 1996 (USFWS 1996) based largely on a significant range reduction and continued threats to surviving populations. Revised critical habitat was designated in March 2010 (USFWS 2010). However, no critical habitat is located in the site vicinity (USFWS 2010). The historic distribution of California red-legged frogs extended from the city of Redding in the Central Valley and Point Reyes National Seashore along the coast, south to Baja California, Mexico. The species' current distribution includes isolated locations in the Sierra Nevada and the San Francisco Bay area, and along the central coast (USFWS 2002).

California red-legged frogs inhabit perennial freshwater pools, streams, and ponds throughout the Central California Coast Range as well as isolated portions of the western slopes of the Sierra Nevada (Fellers 2005). Their preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). Embryos of California red-legged frogs hatch in 1–4 weeks, and the resulting larvae require 3–5 months to attain metamorphosis (Cook and Jennings 2007). Nonbreeding frogs may be found adjacent to streams and ponds in grasslands and woodlands.

California red-legged frogs do not have a distinct breeding migration. Some frogs remain at breeding sites all year while others disperse. Red-legged frogs are often found in summer months in foraging habitat that would not be suitable for breeding; these individuals presumably move seasonally between summer foraging habitat and winter breeding habitat. Movements may occur along riparian corridors, but some individuals move directly from one site to another through normally inhospitable habitats (e.g., heavily grazed pastures or oak-grassland savannas) (USFWS 2002, Fellers 2005, Fellers and Kleeman 2007). The distance moved is highly site-dependent, as influenced by the local landscape (Fellers and Kleeman 2007). In its critical habitat designation, the USFWS (2010) considered 1 mi a typical dispersal distance for the species.

During a biological resources survey of the CNWS conducted from 1981 to 1982, Jones and Stokes (1982) noted California red-legged frogs only at the Cistern Pond, where the CDFW had introduced larvae in May 1982. Prior to this introduction, the species was not known to occur on the site. As described above for the California tiger salamander, Downard et al. (1999) conducted extensive surveys for amphibians on the Inland Area of the CNWS. Adult red-legged frogs were detected at the Cistern Pond, Mt. Diablo Creek, 5AT-1 Pond and adjoining freshwater marsh, Rattlesnake Canyon Pond, upper and lower 5AT-2 Pond and adjoining marsh, and in the lower and upper ponds and along the stream at Indian Springs. In addition, tadpoles and/or egg masses were detected at the upper Cistern Pond, 5AT-1 Freshwater Marsh, Rattlesnake Canyon, 5AT-2 Pond, 5AT-2 Lower Marsh, and Indian Springs lower and upper Ponds. Further random surveys at non-fixed locations detected red-legged frogs above the Indian Springs sampling area.

Smallwood and Morrison (2007) conducted focused California red-legged frog surveys on the Project site in summer 2005. They detected California red-legged frogs at the Cistern Pond; however, they did not detect red-legged frogs at the Indian Springs drainage or the 5AT-2 Pond. A check of the Cistern Pond in March 2009 by H. T. Harvey & Associates revealed 17 or more egg masses in a limited portion of the pond, indicating a high population density here.

California red-legged frogs occur on the Project site primarily in ponds and freshwater marsh habitat, which provide suitable breeding habitat, in the southeastern half of the site (Figure 4). Although Mt. Diablo Creek, just south of the Project site does not provide suitable breeding habitat for red-legged frogs due to the lack of deep, long-lived pools (H. T. Harvey & Associates 2011a), red-legged frogs have been recorded at several

locations in Mt. Diablo Creek, and at one location in the grassland west of the creek just south of SR 4. These recorded sightings away from breeding habitat exemplify this species' dispersal capabilities, and red-legged frogs could occur virtually anywhere on the Project site, especially during wet-season dispersal.

Alameda whipsnake (*Masticophis lateralis euryxanthus*). Federal Listing Status: Threatened; State Listing Status: Threatened. On 5 December 1997, the Alameda whipsnake was officially listed as a threatened species under the auspices of the FESA (USFWS 1997). The USFWS designated critical habitat for the Alameda whipsnake on 2 October 2006 (USFWS 2006). However, critical habitat does not occur within or adjacent to the Project site. The Alameda whipsnake is a subspecies of the California whipsnake that occurs mainly in the inner Coast Range of the East Bay counties of Contra Costa and Alameda, and parts of San Joaquin and Santa Clara counties. Its range is fragmented into five populations: the Tilden-Briones, Oakland-Las Trampas, and Mt. Diablo-Black Hills populations in Contra Costa County, the Hayward-Pleasanton Ridge population in Alameda County, and the Sunol-Cedar Mountain population largely in Alameda County with extensions into San Joaquin and Santa Clara counties.

The Alameda whipsnake is typically found in open and partially open, low-growing shrub communities such as coastal sage scrub and chaparral. Rock outcrops are an important feature of this type of habitat because they provide retreat opportunities for the whipsnake and support lizard populations, a primary prey item. The Alameda whipsnake is also frequently found in grasslands, oak savanna, and oak-bay open woodlands near coastal sage scrub and chaparral habitats (Swaim 1994). During a trapping and radiotelemetry study conducted by Swaim (1994), most grassland and woodland locations were within 170 ft of scrub habitat, but distances of greater than 500 ft were also documented. Core use areas of the Alameda whipsnake most commonly occur on south, southwest, southeast, and east facing slopes (Swaim 1994). However, recent information indicates that whipsnakes do make use of north facing slopes in more open stands of scrub habitat (USFWS 2005b). Male Alameda whipsnake home ranges of 4.7 to 21.7 ac have been recorded (Swaim 1994).

Adult whipsnakes appear to have a bimodal seasonal activity pattern with peaks during the mating season in the spring and a second peak in late summer/early fall, possibly due to an increase in availability of prey items (i.e., hatchling lizards) (Swaim 1994). Courtship and mating occur from late-March through mid-June. During this time, males move around throughout their home ranges, while females appear to be more sedentary. Alameda whipsnakes generally retreat into hibernaculum in November, emerging in March; however short, above-ground movements may occur during the winter.

To date, there are no verified records of the Alameda whipsnake on the Project site, and the closest verified records are from Black Diamond Mines Regional Preserve, 4 mi southeast of the site (CNDDDB 2015). The nearest high-quality habitat for whipsnakes is 1.5 to 2.0 mi south of the site on the slope of Mt. Diablo (Contra Costa County 2006).

The habitat assessment performed by Ecology & Environment and Swaim Biological (2009) determined that the lack of extensive scrub, short-grazed nature of the grassland, and distance from potential source populations reduce the quality of habitat on the site for this species. However, they determined that the small patches of sage scrub in upper Rattlesnake Canyon and the grassland with rock outcrops in the areas east of Bailey Road provide potential whipsnake habitat (Figure 4). In addition, the authors concluded that the more extensive areas of scrub cover and rock outcrops present between Stoneman Park and the Project site could support breeding populations of the Alameda whipsnake. Further, they concluded that if breeding populations did occur, they would be close enough to serve as a source population to colonize suitable habitat within the southeastern portion of the Project site and/or result in suitable habitat within the Project site being used by Alameda whipsnakes during dispersal.

If Alameda whipsnakes are present on the Project site, they are expected to occur only in the area southeast of Bailey Road, in and around the patches of sage scrub in upper Rattlesnake Canyon and around larger rock outcrops, and in intervening grasslands.

7.2.2 California Species of Special Concern

Western Pond Turtle (*Actinemys marmorata*). **Federal Listing Status: None; State Listing Status: Species of Special Concern.** The western pond turtle occurs in ponds, streams, and other wetland habitats in the Pacific slope drainages of California and northern Baja California, Mexico (Bury and Germano 2008). The central California population was historically present in most drainages on the Pacific slope (Jennings and Hayes 1994), but streambed alterations and other sources of habitat destruction, exacerbated by frequent drought events, have caused substantial population declines throughout most of the species' range (Stebbins 2003). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats, in clay or silty soils in unshaded (often south-facing) areas up to 0.25 mi from aquatic habitat (Jennings and Hayes 1994). Juveniles feed and grow in shallow aquatic habitats (often creeks) with emergent vegetation and ample invertebrate prey. Nesting habitat is typically found within 600 ft of aquatic habitat (Jennings and Hayes 1994), but if no suitable nesting habitat can be found close by adults may travel overland considerable distances to nest. Most movements on land are associated with nesting, aestivation, or overwintering. Aestivation (an inactive state) may occur during the hottest weeks of the year or during drought conditions, whereas overwintering (a period of reduced activity which may include periods of a hibernation-like state), may occur during the winter months (Hays et al. 1999).

The western pond turtle is known to occur at the Cistern Pond (CNDDDB 2015) but has not been recorded at other locations on the Project site. However, larger numbers have been recorded in the Tidal Area of the CNWS (Downard et al. 1999). As a result, pond turtles are expected to disperse to some extent between the two areas, most likely along Mt. Diablo Creek, but possibly also along the Contra Costa and Clayton canals. This species may also occur in other ponds on the Project site, including temporary ponds as well as perennial ponds.

Coast Horned Lizard (*Phrynosoma blainvillii*); Federal status: None; State status: Special Concern.

The coast horned lizard is a California endemic that is distributed along the coast from Contra Costa County in the north to San Diego County in the south, and in patches throughout the Central Valley (Jennings and Hayes 1994). Coast horned lizards occupy a variety of open habitats possessing sandy, loosely textured soils, including chaparral, coastal scrub, annual grassland, and clearings in riparian woodlands (Jennings and Hayes 1994). They are most strongly associated with loose soils free of plant debris, and with the presence of native ants (Fisher et al 2002). Coast horned lizards breed between April and August, and disperse to overwintering habitats where they hibernate from November through March (Jennings and Hayes 1994).

The coast horned lizard has been reported only once on the CNWS: a single individual was reported by Kuenzi and Morrison (1994, as cited in Downard et al. 1999) in the Inland Area. No details concerning the 1994 record, including the location, are extant (A. Kuenzi, pers. comm. as reported in City of Concord 2010), but the most likely area of occurrence is in the area southeast of Bailey Road. This species is typically associated with loose, often sandy soils, which are completely absent from the Project site. Thus, it is not expected to occur regularly or in large numbers on the Project site, if present at all.

Burrowing Owl (*Athene cunicularia*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The burrowing owl is a small, terrestrial owl of open country. This owl prefers annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, burrowing owls are found in close association with California ground squirrels; owls use the abandoned burrows of ground squirrels for shelter and nesting. The nesting season as recognized by the CDFW (2012) runs from 1 February through 31 August. After nesting is completed, adult owls may remain in their nesting burrows or in nearby burrows, or they may migrate (Rosenberg et al. 2007); young birds disperse across the landscape from 0.1 to 35 mi from their natal burrows (Rosier et al. 2006).

Burrowing owls have been observed in small numbers within grasslands on the Project site, but it appears as though the species occurs primarily as a winter visitor. An individual was observed in the southeastern portion of the Project site in 1981–1982 (Jones and Stokes 1982). A burrowing owl was detected on the Project site in the area southeast of Bailey Road during site visits in 2007 (CH2M HILL 2007), but none were seen during general field surveys conducted throughout the site by H. T. Harvey & Associates between November 2008 and June 2009 (City of Concord 2010).

Short grassland with abundant ground squirrel burrows is present throughout much of the Project site, providing ostensibly high-quality habitat for burrowing owls. However, the results of surveys of the site have consistently demonstrated this species to be present only in small numbers, and primarily during the nonbreeding season. If it breeds on the site, it does so only in very low numbers. The low number of burrowing owls using the site, relative to the abundance of high-quality habitat, suggests that habitat availability is not limiting on-site numbers of this species.

Loggerhead Shrike (*Lanius ludovicianus*). Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting). The loggerhead shrike is a predatory songbird associated with open habitats interspersed with shrubs, trees, poles, fences, or other perches from which it can hunt (Yosef 1996). Nests are built in densely foliated shrubs or trees, often containing thorns, which offer protection from predators and upon which prey items are impaled. The breeding season for loggerhead shrikes may begin as early as mid-February and lasts through July (Yosef 1996). Nationwide, loggerhead shrike populations have declined significantly over the last 20 years. Loggerhead shrikes are still fairly common in parts of the San Francisco Bay area, but urbanization has reduced available habitat, and local populations are likely declining (Cade and Woods 1997, Humple 2008). This species has been observed regularly and fairly commonly in grasslands during biological surveys of the site (Navy 2006), and the species may nest and forage throughout the Project site.

San Francisco Common Yellowthroat (*Geothlypis trichas sinuosa*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The San Francisco common yellowthroat inhabits emergent vegetation and nests in fresh and brackish marshes and moist floodplain vegetation around the San Francisco Bay. Common yellowthroats will use small and isolated patches of habitat as long as groundwater is close enough to the surface to encourage the establishment of dense stands of rushes (*Scirpus* and *Juncus* spp.), cattails, willows, and other emergent vegetation (Nur et al. 1997, Gardali and Evens 2008). Ideal habitat, however, is comprised of extensive, thick riparian, marsh, or herbaceous floodplain vegetation in perpetually moist areas, where populations of brown-headed cowbirds are low (Menges 1998). San Francisco common yellowthroats nest primarily in fresh and brackish marshes, although they nest in salt marsh habitats that support tall vegetation (Guzy and Ritchison 1999). This subspecies builds open-cup nests low in the vegetation, and nests from mid-March through late July (Guzy and Ritchison 1999, Gardali and Evens 2008).

Small numbers of San Francisco common yellowthroats nest in the Project vicinity (Downard et al. 1999) and the species may nest and forage in freshwater marsh and in emergent vegetation and other wetland vegetation on the Project site.

American Badger (*Taxidea taxus*). Federal Status: None; State Status: Species of Special Concern. American badgers, a California species of special concern, are highly specialized fossorial (adapted for burrowing or digging) mammals that occur in a range of habitats, such as annual grasslands, oak woodland savannas, and semi-arid shrub/scrubland, that contain friable soils and relatively open ground. They are primarily nocturnal, though they are often active during the day. Badgers dig burrows both in pursuit of prey (e.g., gophers, kangaroo rats, and chipmunks) and to create dens for cover and raising of young. They breed during late summer, and females give birth to a litter of young the following spring. Solitary animals, the home range of individuals varies by sex, season, and resource availability. A study conducted in northern Monterey County, California documented an average home range size of 479 acres for females and 2948 acres for males (Quinn 2008). American badgers have been recorded in the Project vicinity on only a few occasions, but the species has the potential to occur in grassland habitat virtually anywhere on the site.

Pallid Bat (*Antrozous Pallidus*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The pallid bat occurs throughout California with the exception of the northwest corner of the state and the high Sierra Nevada (Zeiner et al. 1990b). Pallid bats are most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridge structures that are used for roosting (Zeiner et al. 1990b, Ferguson and Azerrad 2004). Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in the crevices, hollows, and exfoliating bark of trees. Night roosts often occur in open buildings, porches, garages, highway bridges, and mines. Colonies can range in size from a few individuals to over a hundred (Barbour and Davis 1969), and usually consist of at least 20 individuals (Wilson and Ruff 1999). Pallid bats typically winter in canyon bottoms and riparian areas. After mating during the late fall and winter, females leave to form maternity colonies, often on ridge tops or other warmer locales (Johnston et al. 2006). Pallid bat roosts are very susceptible to human disturbance, and urban development has been cited as the most significant factor contributing to their regional decline (Miner and Stokes 2005).

Buildings, bunkers, and large trees with cavities provide suitable roosting habitat for the pallid bat on the Project site. However, the abundance, distribution, and species composition of bats using the site has not been well documented. During the multi-season University of Arizona studies (Downard et al. 1999), bats were detected acoustically at a pond at the base of Rattlesnake Canyon, freshwater marsh 5AT, and Indian Springs; however, the species of bat was not determined and mist netting at Rattlesnake Canyon pond and Indian Springs captured no bats.

Townsend's big-eared bat (*Corynorhinus townsendii*). Federal status: None; State status: Species of Special Concern. Pierson and Rainey (1998) identified 39 active Townsend's big-eared bat maternity colonies and 55 maternity roost sites scattered throughout California. The distribution is strongly correlated with the availability of roosting habitat and the absence of human disturbance at roost sites (Pierson and Rainey 1998, Sherwin and Piaggio 2005).

The Townsend's big-eared bat is associated with a variety of different habitat types including coniferous forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitats (Sherwin and Piaggio 2005). Although it is usually a cave dwelling species, known roost sites include limestone caves, lava tubes, and hollow trees, as well as anthropogenic structures such as the attics of buildings or old abandoned mines (Williams 1986, Sherwin and Piaggio 2005).

The Townsend's big-eared bat is a colonial species, with females aggregating in the spring at maternity colonies to begin their breeding season. Maternity colonies in California may be active from March to September (Pierson and Rainey 1998). Females typically give birth to one young, and both females and young show a high fidelity to their group and their specific roost site (Pearson et al. 1952). The Townsend's big-eared bat is easily disturbed while roosting in buildings, and females are known to abandon their young when disturbed (Humphrey and Kunz 1976). They forage primarily upon small moths, and feeds both in-flight and by gleaning insects from foliage (Zeiner et al. 1990b).

Buildings, bunkers, and large trees with cavities provide suitable roosting habitat for the Townsend's big-eared bat on the Project site. However, the abundance, distribution, and species composition of bats using the site has not been well documented. During the multi-season University of Arizona studies (Downard et al. 1999), bats were detected acoustically at a pond at the base of Rattlesnake Canyon, freshwater marsh 5AT, and Indian Springs; however, the species of bat was not determined and mist netting at Rattlesnake Canyon pond and Indian Springs captured no bats.

7.2.3 State Fully Protected Species

Golden Eagle (*Aquila chrysaetos*). **Federal status: None; State status: Species of Special Concern, Fully Protected.** Golden eagles are most common in rugged, open country bisected by canyons where there are ample nesting sites and food. They nest on cliffs of all sizes or in the tops of large trees. The nests are very large, sometimes exceeding 10 feet across, and constructed of sticks (Zeiner et al. 1990a). The species forages on rabbits and larger rodents, but may also take birds and reptiles; some also feed on carrion. The golden eagle is a rare permanent resident or migrant throughout California, but is more common in the foothills surrounding the Sierra Nevada and Coast Ranges and in the southern California deserts.

A pair of golden eagles has nested within a eucalyptus grove located along the eastern boundary of the site, at least sporadically, since the early 1980s. This nest site has been enclosed with fencing and posted by the Navy with information regarding the provisions of the Bald Eagle and Golden Eagle Protection Act. Additionally, several nesting pairs of golden eagles occur on EBRPD lands to the south of the site. Eagles from one or more of these nest sites regularly forage in grasslands on the site, concentrating their activities predominantly in the areas east of Mt. Diablo Creek and southeast of Willow Pass Road.

White-tailed Kite (*Elanus leucurus*). **Federal Listing Status: None; State Listing Status: Fully Protected.** In California, white-tailed kites can be found in the Central Valley and along the coast, in grasslands, agricultural fields, cismontane woodlands, and other open habitats (Zeiner et al. 1990a, Dunk 1995, Erichsen et al. 1996). White-tailed kites are year-round residents of the state, establishing nesting territories that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates (Dunk 1995). Nonbreeding birds typically remain in the same area over the winter, although some movements do occur (Polite 1990). The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles, and prey base may be the most important factor in determining habitat quality for white-tailed kites (Dunk and Cooper 1994, Skonieczny and Dunk 1997). Although the species recovered after population declines during the early 20th century, its populations may be exhibiting new declines as a result of recent increases in habitat loss and disturbance (Dunk 1995, Erichsen et al. 1996).

Pine and eucalyptus plantations and oak woodlands on the Project site provide suitable nesting habitat and the grasslands and other open habitats provide suitable foraging habitat throughout the site. The species has been recorded on the Project site (City of Concord 2010) and breeding in the immediate Project vicinity (Downard et al. 1999).

APPENDIX B-4

HYDROLOGY AND WATER RESOURCES

Hydrology and Water Quality

Setting

Climate and Topography

The project site is located in the eastern portion of the City of Concord, along the Los Medanos Hills. Elevations at the site range from about 100 feet above sea level in the northwestern portion of the site to 1,000 feet above sea level in the Los Medanos Hills. The site experiences a Mediterranean climate, characterized by warm dry summers and mild wet winters. Temperatures rarely drop below freezing, and on average approximately 86 percent of the rainfall occurs between November and April (WRCC, 2015). On average, the project vicinity receives approximately 17 inches per year of precipitation (WRCC, 2015).

Regional and Site Surface Hydrology

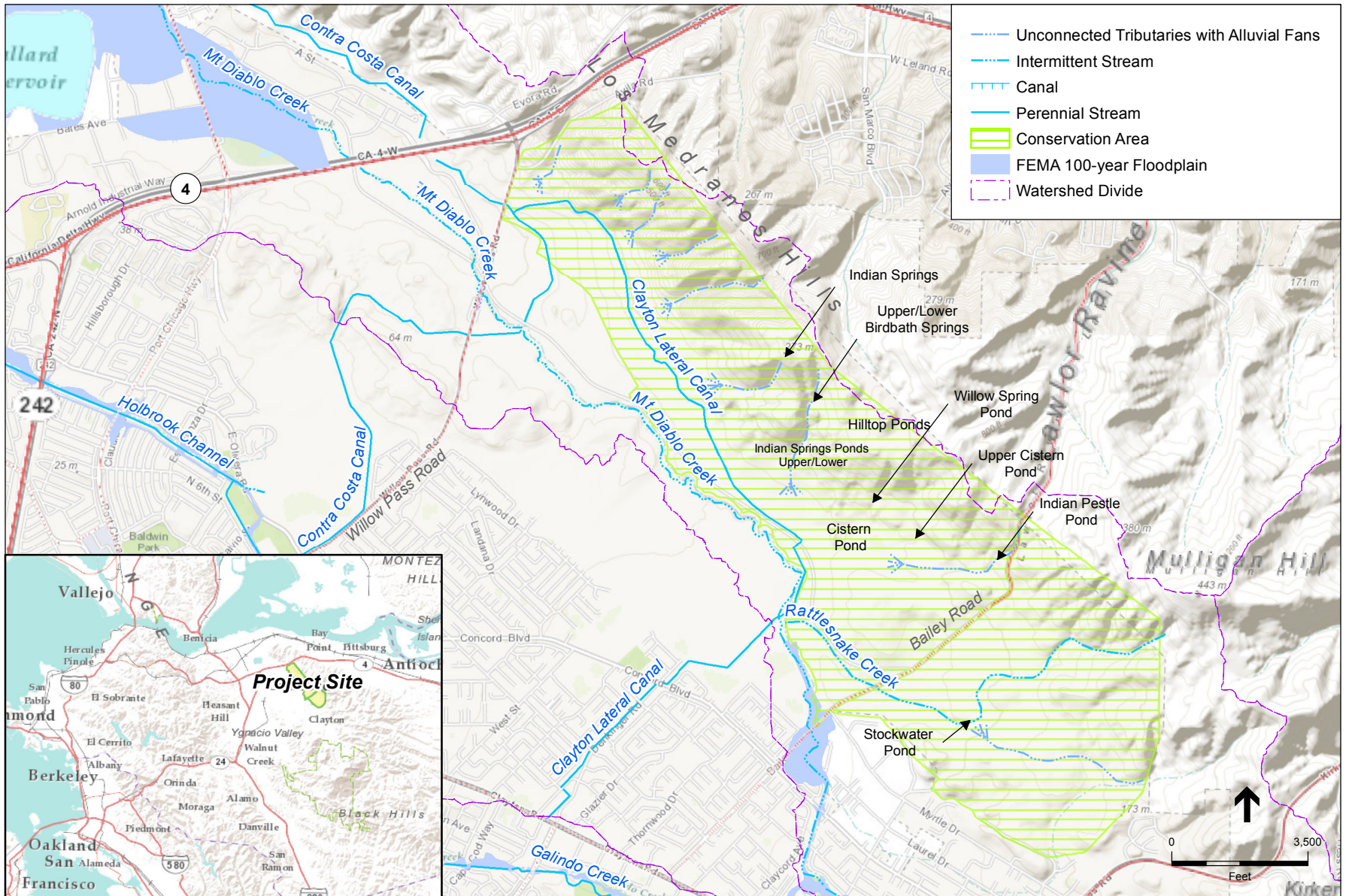
The primary hydrologic features on the project site include the Clayton Canal, Rattlesnake Creek, a short portion of the Contra Costa Canal, and various small ponds. Surface water that does not infiltrate the site soils drains to Mount Diablo Creek, which generally parallels the western border of the project site from the intersection with Bailey Road in the south to the former N Street in the north. An overview of hydrologic features in the project vicinity is presented in **Figure Hydro-1**.

Watershed Setting

The project site is within the 23,800-acre Mount Diablo Creek Watershed (CCRCD, 2006). The headwaters of Mount Diablo Creek watershed are located on the northern face of Mount Diablo, and from there and the hills northeast of Mount Diablo water flows north-northwest through the watershed to wetlands on the south border of Suisun Bay. The watershed includes unincorporated areas of Contra Costa County, the City of Clayton, and portions of the City of Concord (NHI, 2006). Primary creeks within the watershed include Mount Diablo Creek, Mitchell Creek, and Donner Creek. The project site is crossed by tributaries to Mount Diablo Creek, although the site itself does not contain any of the three primary creeks. Over half of the watershed area (54 percent), mostly located upstream of the project site, is land managed as open space or agriculture. Non-agricultural conserved lands make up 22 percent of the watershed area, and 21 percent of the area is developed land (CCRCD, 2006). The remaining areas of the watershed are golf courses or parks. Stream flows throughout the watershed generally mirror the local precipitation patterns and most stream reaches in the watershed are ephemeral (NHI, 2006).

Historic Hydromodification of Mount Diablo Creek

While Mount Diablo Creek does not cross the project site, the creek is the nearest source of potential flooding, and historic modifications to the creek have affected surface hydrology of the project site. The primary Mount Diablo Creek channel was rerouted from a larger westerly channel to the existing channel in the late 19th century (ESA PWA, 2011). As the area developed, the altered land cover in the watershed reduced the amount of precipitation infiltrating the



SOURCE: FEMA, 2009; ESA PWA, 2011; City of Concord, 2009; ESRI

Concord Hills Regional Park Project. 140660

Figure Hydro-1
Watershed Features in Project Vicinity

landscape while also limiting the amount of sediment entering the stream. Consequentially higher volumes of runoff reached Mount Diablo Creek channel more rapidly, initiating a cycle of erosion and channel entrenchment. As the channel has eroded deeper into the landscape, progressively larger flood flows are confined to the channel instead of spilling out onto the surrounding floodplain. This process leads to further erosion, deepening the channel relative to the surrounding topography and undermining the channel banks (ESA PWA, 2011). In addition to erosion of the channel bed, the incision has driven development of steep, unstable banks that are actively eroding in many locations along the reach of Mount Diablo Creek adjacent to the project site (ESA PWA, 2011). As a result of the deep incision of Mount Diablo Creek, in places as much as 25 feet below the surrounding topography, there is very little active floodplain adjacent to the channel (ESA PWA, 2011). Development of the environs surrounding the project site has also introduced culverted road crossings, channelization, bank revetments, and other direct alterations to the creek channel (City of Concord, 2009).

Stream Channels

Eastern Tributaries to Mount Diablo Creek

Several ephemeral tributaries drain the Los Medanos Hills along the eastern portion of the project site. Except for Rattlesnake Creek, all of these small steep tributaries are unnamed. All of the tributaries only flow during and shortly after storms (ESA PWA, 2011). Due to a combination of site geology and the resulting sediment load from the Los Medanos Hills, the water from these tributaries generally does not reach the channel of Mount Diablo Creek, instead flowing into the subsurface through coarse alluvial deposits at the base of the Los Medanos Hills (City of Concord, 2009; ESA PWA, 2011). Grading performed by the U.S. Navy at the site also disconnected local runoff from the Mount Diablo Creek channel by altering the natural topography of the project site (City of Concord, 2009).

Willow Creek Drainage

A small portion of the eastern boundary of the site drains east to the Willow Creek watershed, towards the City of Pittsburg. There are no channels in this portion of the project site along the northeastern face of Los Medanos Hills, and drainage is limited to sheet flow only during high-intensity storms (City of Concord 2009).

Canals

The two canals that cross the project site, the Clayton Canal and the Contra Costa Canal, are owned by the U.S. Bureau of Reclamation. The Clayton Canal was built in 1949 and was used until approximately 20 years ago. The Contra Costa Canal was completed in 1948 and operates spring through fall. Neither of the canals receives significant runoff from the project site (City of Concord, 2009).

Other Surface Water Features

Several stock ponds, watering holes, and seepage ponds are located in the uphill areas of the project site, including upper and lower Birdbath Springs, Willow Springs Pond, Indian Pestle Pond, several hilltop ponds, and other unnamed ponds (Navy 2006). Water levels in these ponds vary seasonally and are generally high in winter as a result of seasonal precipitation before

gradually drying out during the summer (Navy, 2006). Cistern Pond and Indian Springs are the only perennial ponds at the site (Navy, 2006).

Groundwater

Groundwater is water that occurs underneath the earth's surface, in the pores and fractures in sediments and rocks. When water completely fills the void space of sediment pores or rock fractures, the pores or fractures are said to be saturated. Water that completely saturates the pore or fracture space available is typically called groundwater. The top of the zone filled with groundwater is known as the water table. Groundwater moves through the subsurface from higher elevations to lower elevations and from locations of higher pressure (called hydraulic head) to locations of lower pressure. The rate at which groundwater moves is also influenced by the physical properties of the earth materials present, such as the size and connectivity of pore or fracture spaces. Water generally enters the groundwater system as precipitation that slowly infiltrates soil and rock, although human activities such as irrigation and groundwater injection also deliver water to the groundwater system. Groundwater exits the subsurface by flowing into open water bodies (such as streams, lakes, and oceans), flowing onto the ground surface as springs or seeps, and via human-developed water wells.

The properties of the rocks and soil in an area affect the infiltration of surface water and the movement of groundwater. The bedrock ridge underlying the Los Medanos Hills is composed of sandstone, siltstone, mudstone, and conglomerate rock units, as well as unconsolidated sediments. The rocks of the Los Medanos Hills give way to thick unconsolidated alluvial deposits in the western portion of the project site. Groundwater is generally found at depths of 30 to 50 feet below ground surface in the unconsolidated alluvium, under semi-confined to confined conditions (Navy, 2006). Groundwater underlying the project site is east of and adjacent to the Clayton Valley groundwater basin, except for a small portion of the site between Clayton and Contra Costa Canals where the project site is within the Clayton Valley groundwater basin (RWQCB, 2013). The water bearing alluvium in the Clayton Valley groundwater basin is over 700 feet thick (DWR, 2004). Groundwater levels in the basin have demonstrated a slight gradual decline over the past 50 years (DWR, 2004). Limited data exist regarding the occurrence and movement of groundwater in the basin (DWR, 2004). Mount Diablo Creek marks the division between project site groundwater and the Clayton Valley groundwater basin. While the groundwater under the project site is not part of a mapped groundwater basin, it has been encountered in other studies of the site. Groundwater from the Clayton Valley basin supplies wells used to water livestock and to irrigate a nearby golf course (Navy, 2006).

Water Quality

Surface Water

Beneficial Uses

As part of the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin, the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), is charged with identifying and protecting beneficial uses of the Bay Area's surface waters. The Basin Plan is the guiding document for the RWQCB to identify water quality objectives and

develop enforcement actions to protect water quality and to carry out the objectives of the Federal Clean Water Act. Accordingly, the RWQCB has identified the following existing beneficial uses for Mount Diablo Creek: cold freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, warm freshwater habitat, wildlife habitat, water contact recreation, and noncontact water recreation. Beneficial uses of Rattlesnake Creek and other smaller tributary ephemeral streams are not specifically identified in the Basin Plan; however, the Basin Plan states that the beneficial uses of any specifically identified water body generally apply to all its tributaries. Beneficial uses of streams that have ephemeral flows must be protected throughout the year and are designated as “existing” (RWQCB, 2013). By extension, the beneficial uses of Mount Diablo Creek therefore also apply to other ephemeral flows on the project site.

Surface Water Ambient Monitoring Program

The Surface Water Ambient Monitoring Program is designed to assess the conditions of surface waters throughout California (SWRCB, 2015). A Surface Water Ambient Monitoring Program was implemented in 2003 at eleven locations in the Mount Diablo Creek watershed (RWQCB, 2008). Water quality indicators used in this monitoring program included the health of benthic macroinvertebrate assemblages, water temperature, dissolved oxygen, presence of nutrients (nitrogen, phosphorus) and metals in water or sediments, and water toxicity. Except for reaches downstream of Mount Diablo State Park, the benthic macroinvertebrate assemblages present in sampling locations indicated poor watershed health conditions including in areas sampled near the project site (RWQCB, 2008). At the monitoring station nearest to, but upstream of, the project site, water quality benchmarks were exceeded for water temperature, dissolved oxygen, and nutrient levels (RWQCB, 2008). Mercury and nickel were also found in the creek sediments at the monitoring station near the project site.

Impaired Water Bodies

Section 303(d) of the Clean Water Act directs the RWQCB to identify water bodies that do not meet State or federal standards for pollutants. Water bodies that exceed RWQCB criteria for water quality are considered impaired, and are added to the State’s impaired water body list, also referred to as the 303(d) list. The RWQCB prioritizes water bodies on this list based upon potential impacts to beneficial uses. Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. Mount Diablo Creek is on the impaired water body list for Diazinon and toxicity. Diazinon is a synthetic orthophosphate that was used for pest control before it was outlawed for residential use in the U.S. in 2004. It is still approved for agricultural uses. Toxicity was determined by taking samples from locations along Mount Diablo Creek and evaluating how well the water samples supported three common organisms. One sample from upstream of the project site and one sample from downstream of the project site exceeded water quality benchmarks for toxicity (RWQCB, 2008).

Groundwater Quality

The California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), is also charged with identifying and protecting beneficial uses of the Bay Area’s ground waters, and

has done so for Clayton Valley groundwater basin (RWQCB, 2013). Existing and proposed beneficial uses of Clayton Valley groundwater include municipal and domestic supply, industrial process supply, industrial service supply, and agricultural supply (RWQCB, 2013). The groundwater quality at the site has been characterized as fair, with relatively high total dissolved solids, chlorides, hardness, and iron concentrations (Navy, 2006).

Flooding

Project Site

During large flood events, most natural streams overtop the banks of the low-flow channel and inundate adjacent low-lying areas. This overflow area is referred to as the floodplain of the stream. Channel incision on Mount Diablo Creek has resulted in a deep channel with oversteepened banks that is not hydraulically connected to the adjacent floodplain through much of the area; however, frequent flooding has been observed downstream of Willow Pass Road, just outside of the project site (ESA PWA, 2011). In the creek reach that parallels the project site, incision and bank erosion have enlarged the channel to the extent that flood flows are entirely contained within the existing channel (ESA PWA, 2011).

The Federal Emergency Management Agency (FEMA) maps flood-prone areas to establish flood risk zones as part of the National Flood Insurance Program. FEMA's flood hazard maps typically delineate the 100-year floodplain (the area inundated by a flood event that occurs, on average, once in every 100 years), and are also used by states and communities for emergency management and for land use and water resource planning. However, FEMA does not typically map flood hazards within federal facilities. The most recent published maps by FEMA indicate that detailed mapping has not been done over most of the project site (FEMA, 2009). The project site contains one very small area just downstream of Bailey Road that has been delineated as a Special Flood Hazard Area (within the 100-year floodplain) (FEMA, 2009); this area is less than 1 percent of the total project area. FEMA is currently in the process of developing a detailed hydraulic model of Mount Diablo Creek under existing conditions, which will then be used to define and map the 100-year floodplain on the site (ESA PWA, 2011).

However, a hydraulic analysis has been performed for Mount Diablo Creek to support flood hazard management, which used estimated 10-year, 50-year, and 100-year peak discharges to model floods along the creek. Discharge is the rate of water flow in a stream. Peak discharge is the water flow that occurs when the maximum flood stage or depth is reached in a stream as a result of a storm event. FEMA and the Contra Costa County Flood Control and Water Conservation District (CCCFCD) have both developed estimates of peak discharge in Mount Diablo Creek. The CCCFCD discharge estimate was calculated using the unit hydrograph method (ESA PWA, 2011) which is different from the method used by FEMA, so the two estimates differ but provide a range of peak discharge values for consideration in planning. Two peak discharge estimates, one for a point located at the upstream boundary of the project site and one located downstream of the project site, are shown in Table 1, below.

TABLE 1
PEAK DISCHARGE DATA FOR MOUNT DIABLO CREEK

Location	Area (square miles)	Peak Discharge					
		10- year (cfs)		50-year (cfs)		100-year (cfs)	
		FEMA	CCCFC	FEMA	CCCFC	FEMA	CCCFC
At Bailey Road	22.1	3,670	4,210	5,670	6,420	6,350	7,170
At Port Chicago Highway	30.0	4,240	4,300	6,660	6,700	7,470	7,570

SOURCE: ESA PWA, 2011

A preliminary hydraulic analysis of existing conditions along Mount Diablo Creek prepared for the City of Concord modeled the 100-year peak flow using the more conservative of each peak discharge estimate (ESA PWA, 2011). The 100-year peak flow was contained within the existing channel of Mount Diablo Creek along most of the project site. Immediately downstream of Bailey Road, hydraulic model results indicate that the estimated 10-year peak flow water level would be contained by the channel and the 100-year peak flow would overtop the channel in some areas. Thus, during the 100-year storm event, fluvial flooding would likely occur in the corner of the site near Mount Diablo Creek just north of Bailey Road (near the area mapped by FEMA as within the 100-year floodplain), but not anywhere else on the site.

Downstream Areas

Downstream of the project site, FEMA has mapped the area through the Diablo Creek Golf Course and West of Port Chicago Highway as inside the 100-year floodplain. The mapped floodplain includes the Administration Area entrance gate, the majority of the Diablo Creek Golf Course, and Port Chicago Highway. Consistent with field observations and FEMA mapping, in the reach north of Willow Pass Road the modelled 10-year flow overtopped the channel banks by approximately 2 feet and the modelled 100-year flow by approximately 3 feet (ESA PWA, 2011).

Regulatory Framework

Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402(p) of the CWA controls water pollution by regulating sources that discharge pollutants into waters of the United States. The USEPA has delegated authority for issuing NPDES permits in California to the California State Water Resources Control Board, which has nine regional boards. The San Francisco Bay RWQCB regulates water quality in the project area.

Section 303(d) List of Impaired Water Bodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are “impaired” (i.e., do not meet one or more of the water quality standards established by the state, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. Mount Diablo Creek is listed as impaired for Dianizon and toxicity (RWQCB, 2013; see discussion above), an impairment which applies to all tributaries of the creek including the surface water features of the project site.

Executive Order 11988 and National Flood Insurance Program

Under Executive Order 11988, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year. Also, FEMA administers the National Flood Insurance Program, which requires that local governments covered by federal flood insurance enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood zone (one percent chance of occurring in a given year). FEMA prepares Flood Insurance Rate Maps (FIRMs) that indicate areas prone to flooding. The City of Concord is responsible for issuing permits within designated flood zones in the project area.

State Regulations***Porter-Cologne Water Quality Control Act***

The passage of the Porter-Cologne Water Quality Control Act in 1969, with later amendments (collectively referred to here as Porter-Cologne), implemented California’s requirements under the federal Clean Water Act and designated the SWRCB with the ultimate authority over California water rights and water quality policy. Porter-Cologne also established nine RWQCBs, which are responsible for planning, permitting and enforcement of water rights and water quality standards. The Porter-Cologne Act was incorporated into California Statutes as California Water Code Sections 13300-13999 and Title 23 of the California Administrative Code. Porter-Cologne provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Porter-Cologne Act allows the California SWRCB to adopt statewide water quality control plans or “Basin Plans”, which serve as the legal, technical, and programmatic basis of water quality regulation for a region. The Act also authorizes the NPDES program under the CWA, which establishes effluent limitations and water quality requirements for discharges to waters of the state.

California Toxics Rule

Under the California Toxics Rule (CTR), the USEPA has proposed water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries. These federally

promulgated criteria create water quality standards for California waters. The CTR satisfies CWA requirements and protects public health and the environment. The USEPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits (discussed in Local Regulations and Land Use Plans, below) that regulate existing discharges in the project area.

Anti-Degradation Policy

The SWRCB Anti-Degradation Policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Water in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. In particular, this policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses.

Under the Anti-Degradation Policy, any actions that can adversely affect water quality in all surface and ground waters must: (1) be consistent with maximum benefit to the people of California; (2) not unreasonably affect present and anticipated beneficial use of the water; and (3) not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Anti-Degradation Policy (40 CFR § 131.12) developed under the CWA. Discharges from the proposed project that could affect surface water quality would be required to comply with the Anti-Degradation Policy, which is included as part of the NPDES permit requirements for point discharges (discussed below).

NPDES Construction General Permit

Construction associated with the proposed project would disturb more than one acre of land surface affecting the quality of stormwater discharges into waters of the U.S. The proposed project would therefore be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002) (Construction General Permit) (SWRCB, 2009). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. Depending on the Risk Level, the construction projects could be subject to the following requirements:

- Effluent standards;
- Good site management “housekeeping”;
- Non-stormwater management;
- Erosion and sediment controls;
- Run-on and runoff controls;
- Inspection, maintenance, and repair; and
- Monitoring and reporting requirements.

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent pollutants from contacting stormwater and keep all products of erosion from moving offsite into receiving waters. The SWPPP BMPs are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Local Regulations and Land Use Plans

City of Concord General Plan

The City of Concord General Plan includes the following relevant policies regarding surface water, groundwater, water quality, and flooding.

- POS-3.1.1 Enhance and maintain the natural values of creeks and major drainage ways.
- POS-3.1.3 Requires adequate building setbacks for development adjacent to creek banks and major drainage ways to protect neighboring properties from erosion and flooding.
- POS-3.1.6 To the extent practical, preserve creeks in a natural condition while providing for the need to convey storm water.
- S-4.1.1 Manage development to ensure compliance with the City’s Flood Management Ordinance and the City’s Stormwater Management and Discharge Control Ordinance.
- S-4.1.2 Establish engineering design standards for constructing a storm drainage system to protect against loss of life and property and minimize risks of flooding. This system should include a combination of constructed facilities and natural creeks which are managed to reduce flood hazards.
- S-4.1.3 Coordinate storm drainage management with appropriate agencies, including the County Flood Control and Water Conservation District, Regional Water Quality Control Board, Army Corps of Engineers, Department of Fish & Game and with the Contra Costa Water District, in the vicinity of the Contra Costa Canal.

- S-4.1.4 Design storm drainage facilities to meet the Contra Costa County Flood Control and Water Conservation District standards and ensure adequate and safe flow to minimize flooding.
- PF-1.3.1 Require new development to provide any needed storm drains that are not part of the City's master storm drain system and to incorporate features into site improvement plans to minimize surface runoff.

Concord Reuse Project Area Plan

The Concord Reuse Project Area Plan, which is incorporated by reference in the City of Concord General Plan, includes the following relevant policies regarding surface water, groundwater, water quality, and flooding.

- C-2.3: Preserve natural drainage patterns and watersheds on the site, and enhance the beneficial uses associated with Mt. Diablo Creek and other drainage features.
- C-2.5: Conduct detailed site planning that limits the need for excessive grading. Where grading does occur, promptly revegetate disturbed areas to avoid erosion and minimize soil loss.
- C-2.2: Limit development on slopes that are 30 percent or greater. Where such slopes occur within the areas shown for urban uses on the Area Plan Diagram, they should generally be set aside as public or private open space in order to minimize the need for grading and earth movement. In the areas closest to the North Concord / Martinez BART station, some development on steeper slopes may be acceptable in order to maximize transit-oriented development opportunities.
- C-3.1: Work with regional, state and federal resource agencies with permitting authority relating to hydrology and creek habitat to obtain necessary permits as part of the sitewide process discussed in C-1.2 and to establish requirements for restoration and flood control activities.

Permits are expected to include requirements for a buffer area along Mt. Diablo Creek and specific mitigation requirements that would be associated with any loss of riparian and aquatic habitat. In the event of conflicts between the conditions of such permits and policies included in the General Plan, permit provisions shall govern.
- C-3.2: Coordinate with regional, state and federal resource agencies as part of the site-wide permitting process to develop detailed plans for the restoration of Mt. Diablo Creek, accommodating the need for flood control while also restoring aquatic conditions within the creek channel and riparian habitat along the banks and, as appropriate, accommodating passive recreational uses.

- C-3.3: Consistent with applicable regulations and permits, require future development to incorporate creek restoration and flood control measures along Mt. Diablo Creek that increase flow capacity within the channel, increase the extent of riparian vegetation, enhance habitat value, and improve passage for aquatic species. Flood control projects should be viewed as an opportunity to improve habitat and restore natural features.
- C-3.4: Design and construct bridges across Mt. Diablo Creek in a way that minimizes impacts on stream flow, riparian vegetation, aquatic species, and stream ecology. Place fill or structures outside of the channel to the maximum extent feasible, and use native soil and other natural materials when disturbances are necessary.
- C-3.5: Avoid adverse impacts to riparian and aquatic habitat through site planning and construction practices. Any loss of habitat shall be mitigated consistent with permit requirements and the measures specified in the CCRP FEIR (January 2010).
- C-3.6: Subject to provisions of applicable permits from resource agencies, explore opportunities to restore smaller streams and tributaries on the site, through methods including daylighting buried culverts, restoring the natural drainage course near the former airfield that conveys perennial flows, and enhancing Willow Pass Creek.
- C-3.7: Retain both the Contra Costa and Clayton canals for purposes of integration with recreation and open space connectivity, unless evaluation of cost and off -site impacts lead to a determination that undergrounding (Contra Costa canal) or abandonment (Clayton canal) are superior options.
- C-4.2: Consistent with requirements and programs of the RWQCB, implement best management practices for water quality during construction to minimize the transport of sediment and other harmful materials into drainage ways, creeks, and downstream areas.
- In addition to containing sediment and stabilizing soils during construction, best management practices should address the potential for spills, reduce the effects of heavy equipment and vehicles, and minimize the impact of urban runoff during post-construction conditions.
- C-4.3: Prior to approving any development, prepare a Stormwater Pollution Prevention Plan as required by the RWQCB.
- The Plan can be initiated by the City at a general level of detail, with additional specificity prepared by developers for specific sites. The Stormwater Pollution Prevention Plan will be updated as needed to reflect the evolution of stormwater Best Management Practices. The Plan can be prepared for the site in portions or

as a whole. It will include measures to minimize and control potential pollution sources, including limits on impervious surface coverage within future development districts, requirements for replanting of disturbed areas, erosion control strategies, limits on grading and earth moving, containment plans for hazardous material spills, and other programs which prevent contaminated runoff.

- C-4.4: Coordinate water quality improvements with appropriate agencies, including the County Flood Control and Water Conservation District, RWQCB, Army Corps of Engineers, California Department of Fish and Game (CDFG), and the CCWD.

City of Concord Development Code (Chapter 18)

The City of Concord Municipal Code Chapter 18 (also called the Development Code) includes ordinances designed to protect surface water quality. Chapter 18.305 Creek and Riparian Habitat Protection provides standards for the protection, maintenance, enhancement, and restoration of creeks, streams, and waterways in a manner that preserves their ecological integrity, function, and value. Under this code, unless the City Engineer waives it due to a determination that there would be no significant impact on a waterway or that sufficient information about the waterway already exists, a site-specific hydrologic study is required for improvements or proposed development on any site crossed by a watercourse as defined by the City or USGS.

Recommendations

- Map on-site drainage patterns and facilities (ditches, berms etc.) to better understand current surfacewater drainage patterns and areas prone to flooding.
- Identify opportunities to improve site hydrologic conditions through restoration of historic site hydrology and drainage patterns, and minimizing hardscaping where future hydromodification is required.
- Locate future improvements to avoid impacts on wetlands and streams, and outside flood zones.
- Minimize the creation of new impervious surfaces and seek to treat all new stormwater runoff onsite.

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APPENDIX B-5

BUILDING EVALUATION SUMMARY



Building Evaluation Summary
for
Select Structures
at
Concord Hills Regional Park

Prepared by:

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INTRODUCTION

Siegel & Strain Architects (S&S) and (DT) Trachtenberg Architects, were engaged as sub-consultants to PlaceWorks to conduct a building evaluation of up to four structures or structure types at the Concord Naval Weapons Station. This work was conducted as a component of a Land Use Plan for the proposed Concord Hills Regional Park, being prepared for the East Bay Regional Park District (EBRPD). The purpose of the evaluation is to establish the general condition of the structures and to collect enough information about condition, size, type and character to plan appropriate uses for the structures.

Siegel & Strain Architects and Trachtenberg Architects visited several sites at the Concord Naval Weapons Station on March 17, 2015, with Brian Holt of the East Bay Regional Park District. The group evaluated Building 1A-24 and a typical Magazine with a visual inspection inside and around the perimeter of the structures. There were no utilities in service at the time of the visit, therefore no building systems were evaluated. There was no access to the roof nor any upper portion of the structures. The group did a cursory 'drive by' viewing of the Building 97 complex. The group visited the Building 87 Complex and evaluated the site but not the buildings.

The decision to retain and reuse a given structure will be made through the planning process. Factors that may contribute to the decision-making process may include building condition; building size; building character; suitability for meeting accessibility requirements; general suitability to a proposed use; location relative to other potential uses; and potential access by pedestrians, bicyclists and vehicles. Building reuse may also hinge on ease of repair and alteration for a proposed use.

Potential advantages that may be gained by re-use of structures include retention of the character of a building and/or a site; the ability to interpret events that occurred in the buildings or in buildings similar to them; and efficient use of material resources. Potential disadvantages of reusing buildings include challenges meeting codes; difficulty making a building energy efficient; and trade-offs in meeting programmatic requirements.

Although cost is not in the scope of this report, it should be noted that re-use of existing buildings can incur costs that are equal to or greater than a new building, depending on the scope of the repair and alteration that is required to meet code and to provide the components required for a given use. On the other hand, if a building is in good condition and does not require extensive alteration to meet a program, the cost can be lower than constructing a new building. It is worth noting that existing buildings sometimes contain hidden conditions that cannot be identified with a visual inspection, and which may have cost implications.

Related Documents

The architects had access to the Historic Building Inventory and Evaluation prepared by JRP Historical Consulting Services, dated, June 2009. Any reference to former uses or other historical data was gleaned from this document.

BUILDING 1A-24 AND ENVIRONS

Description:

Building 1A-24 is a former shop and warehouse building with a large volume of approximately 11,000 sf and a set of lower spaces along part of the west side. It is a poured-in-place concrete building with a steel structural frame. The east and west facades have large expanses of metal factory windows; the east side has original steel sash, the west side has replacement aluminum sash. The floor is concrete, apparently slab-on-grade, with various joints, drains, curbs and platforms. The west side of the building has a 4-foot high loading dock and a concrete ramp.

Condition:

The building shell is in fair to good condition overall. The walls and roof appear to be sound, although water intrusion is implied by the presence of efflorescence. The floor is in poor condition, with many irregularities, probably due to hard use. The windows are in fair to poor condition and would require repair or replacement, depending on use. The doors are all likely to need to be replaced. As noted above, none of the systems could be evaluated, and they are assumed to require replacement.

Character:

The main space is a generous open room with complete daylight. The concrete and steel structure with metal sash windows defines the industrial appearance. The overall effect is a beautifully daylighted, open, lofty space. There is a steel crane and a range of industrial fittings, as well as various concrete utility slabs and platforms, some or all of which could be retained and interpreted to illustrate the history of the space.

Surrounding Site:

The building sits on a site that slopes gently to the west. There is a drop of approximately 4-feet from the loading dock to the adjacent grade on the west side of the building. The east side of the building is roughly at grade.

There are 2 utility sheds (1A-24A and 1A-24B) near the southwest corner of 1A-24, which are constructed of cast-in-place concrete and steel columns. These are enclosed on three sides with one long side open. 1A-24B has been modified with a wood infill enclosure. A small steel-sided, open shed sits to the southeast of 1A-24. The area between these buildings is paved.

Farther to the south there is a one-story office building (1A-55) with a utility shed to the east, and south of the office building is another paved area.

Uses:

1A-24 could be maintained as a warehouse or utility structure, however its character lends itself to adaptation to a variety of uses. These uses may include offices, park partner programs, conference or event facilities, and the like. Such uses will be addressed in a separate report. The dramatic daylighted space and large view windows, combined with the industrial character of the building, would make for a memorable public venue or visitor center and the location within the Park would have good connections to roads and trails. The main room is larger than would likely be required for a visitor center, and the space could easily be demised along the column lines to provide spaces for other uses. A portion of 1A-24 could be made open air, providing shelter during the hot summer months.

Due to the topography, the building entrance is most likely to be on the east side where the floor level is closest to grade. It may make sense to provide day-to-day parking at the south end of the building, where there is a paved area up against a blank wall and where the adjacent shed could form a courtyard of sorts, shielding cars from view. Overflow parking could be set up in the paved area to the south of 1A-55.

1A-55, while not officially part of this study, appears as though it could serve as an office for EBRPD staff or a park partner organization.



Building 1A-24: view of east façade from south



Building 1A-24: view of west façade



Building 1A-24: view of south façade and paved area



Building 1A-24: main interior space looking south



Building 1A-24: detail of ceiling showing efflorescence



Building 1A-24A: view of east façade



Building 1A-24B: view of west façade



Building 428: view of west façade



Building 1A-55: view of north and west façades



Paved area south of 1A-55: panoramic view looking south

TYPICAL MAGAZINE

Description:

The typical magazines in the quadrant east of Building 1A-24 are relatively small poured-in-place concrete structures, covered in earth, each with a retained blast deflection area in front of the entry. The enclosed structure is approximately 520 sf and the retained blast deflection area is roughly 575 sf. The magazine is a barrel vault with large double steel doors at one end and no other openings. A gravity ventilator extends above the earthen surface of the roof area.

Condition:

The building shell is in fair to good condition overall. The walls and roof appear to be sound, although water intrusion is evidenced by efflorescence. The doors are in fair condition, as are the retaining walls in the blast deflection area. There appears to be no active mechanical or plumbing equipment in the structure.

Character:

The single room is a simple, vaulted space with striking concrete work. Daylight is only available when the pair of doors is open. The daylight is intense at the one source and creates dramatic lighting.

The blast area has tall battered walls that form an enclosed area that is open to the sky above and to the west end.

The overall character is industrial. The form appears sculptural from a landscape perspective, particularly when viewed from a distance within the entire set of identical magazines.

Surrounding Site:

The magazines sit on a gently sloping site, that slopes to the west. The magazines are set within a geometric grid and a set of parallel streets. From the entry to the blast deflection area there is a view that encompasses Mt Diablo to the southwest and sweeps around to the northwest, taking in views of distant hills and urban areas, as well as Building 1A-24 in the middle ground.

Uses:

The magazines are in close enough proximity to the potential visitor/interpretive center at Building 1A-24 that it would be logical to include a magazine as part of an interpretive trail that commences at the visitor center. The distance and the topography make it likely that such a trail would be a candidate for an on-grade ADA-compliant trail.

It should be noted that if the building is unmonitored, any uses need to consider the potential for mischief or vandalism. Further, the earth covered roofs may attract off-trail access and put users in proximity of a fall hazard.



Typical Magazine: view of interior looking toward entry doors



Typical Magazine: view of blast deflection and entry area, as well as earthen roof covering



Typical Magazine: view of vicinity looking southwest toward 1A-24

BUILDING 87 COMPLEX

Description:

The Building 87 Complex includes a set of three nondescript warehouse and utility buildings. The complex sits on a benched hillside area accessed by a steep road. The site is characterized by panoramic views that take in Mt Diablo to the southwest, urban areas to the west, and Suisun Bay, with Port Chicago, to the north. In the foreground the views capture various components of the Concord Naval Weapons Station, below.

Condition:

Not formally reviewed

Character:

Not formally reviewed, however the buildings have very few character defining features.

Surrounding Site:

Not formally reviewed, except for views, above.

Uses:

The buildings on this site are currently appropriate for some type of utility use such as warehouse, maintenance yard, garage, and the like. The buildings would require significant alteration to be used as offices or for visitor functions such as education, conference or interpretation. Further, the buildings have few character defining features, therefore would require alteration to provide an appropriate visitor experience for any of these potential uses.

Because of the location and views from the site this location would be logical for some type of commemorative or interpretive programming related to the Port Chicago events. The location and type of access (pedestrian, bicycle, or vehicular) would be a factor in determining which uses are appropriate for this site, given the distance from any logical park entry.



Building 87: view of west façade



Building 87: view of south facade



Building 87: view from site toward southwest



Building 87: view from site toward west, with urban area in distance and CNWS in foreground



Building 87: view from site toward north, with Suisun Bay and Port Chicago in the Distance

BUILDING 97 COMPLEX

Description:

This site is made up of three non-descript industrial buildings and utility structures that make up a former Warhead Assembly and Testing area. The complex sits on a benched hillside area accessed by a steep road. The site is bare of large vegetation and has views of Mount Diablo, the Concord Naval Weapons Station below, and urban areas beyond.

Condition:

Not formally reviewed

Character:

Not formally reviewed, however the buildings have very few character defining features.

Surrounding Site:

Not formally reviewed

Uses:

The buildings on this site are currently appropriate for some type of utility use such as warehouse, maintenance yard, garage, and the like. The buildings would require significant alteration to be used as offices or for visitor functions such as education, conference or interpretation. Further, the buildings have few character defining features, therefore would require alteration to provide an appropriate visitor experience for any of these potential uses. The location and type of access (pedestrian, bicycle, or vehicular) would be a factor in determining which uses are appropriate for this site, given the distance from any logical park entry.

APPENDIX

Building Survey Forms
for
Building 1A-24
and
Typical Magazine

Existing Conditions Survey

Surveyed by: Nancy Malone, S&S; David Trachtenberg, DTA; by walk through and visual inspection.

Date: 3/17/15

Building: Bldg IA-24

Location: Kinney Boulevard, Concord Naval Weapons Station

Current Use: Currently unoccupied

Former Use/s: Former "Battery Charging Building ," warehouse and shop.

Approximate size of Building and number of rooms:

Main shop of approx. 11,000 sf; smaller spaces that appear to have been office, restroom and machine shop

REVIEW OF RESOURCE:

Key: Excellent (E), Good (G), Fair (F), Poor (P)

Exterior Condition:

North Wall	Cast-in-place concrete, painted exterior, (G) to (F)
South Wall	Cast-in-place concrete, painted exterior, (G) to (F)
East Wall	Cast-in-place concrete, painted exterior, (G) to (F)
West Wall	Cast-in-place concrete, painted exterior, (G) to (F)
Roof	Low slope, built-up roofing, over cast-in-place concrete deck, over steel I-joist system, (G) to (F)
Windows	Original steel sash on east (F) to (P); aluminum replacement on west and others (F) to (P)
Doors	Miscellaneous types, (P)
Other	Miscellaneous porches and appurtenances (P)

Exterior Character: Simple volume characterized by large east- and west-facing glazing systems and a low office wing on the west side.

Interior Condition:

Wall type 1	Cast-in-place concrete, painted to wainscot height, some effluorescence. (G) to (F)
Wall type 2	Wood framed infill/demising walls, probably not original. (P)
Wall type 3	CMU demising walls, probably not original. (F)
Ceiling	Cast-in-place concrete, some effluorescence. (G) to (F). 21'-10" high in main space.
Windows	As above. Sill at 5'. Some units on west façade have been blocked off with solid panels. (F)
Doors	Miscellaneous types, (P)
Floor	Concrete slab with irregularities, cracks and floor drains; (P)
Other	2 small, wood-framed volumes appear to have been added. (P)

Interior Character: Main space is a generous open room with complete daylight. Concrete and steel structure with metal sash windows define industrial appearance. Various concrete utility slabs/structures are present throughout the space. Overall effect is a beautifully daylight, open, lofty space. Crane in main space could be retained as part of character.

Structural System: Steel load bearing column and beam system with cast-in-place concrete walls and roof. Floor is concrete and is assumed to be structural slab-on-grade.

Mechanical & Plumbing: Assumed to be inoperable and need replacement

Electrical & Lighting: Assumed to need replacement

Daylighting: High levels of daylight, but likely to also have glare issues from direct morning and afternoon sun on east and west sides, respectively.

Views: To east: Significant views of hills to east from main space; magazines are in the foreground
To west: Views of riparian corridor from parts of main space

Surrounding Site: The site has a very low slope, sloping to west.
Three utility sheds are located to the south and beyond these is a small office building.

Opportunities & Constraints: The main space would be suitable for many uses and is especially notable for its total size. It is divided into 10 structural bays, which create logical places to subdivide the space.
The best on-grade access to the building is at the East (there is a 4' drop at the West side)
Utility sheds at the south and southeast of the building may serve to shield parking from views; overflow parking would work in the area further south (beyond small office building.)

Notes: Utilities not currently active, therefore unable to evaluate building systems.
Transformers at south and east ends of buildings have been decommissioned and need to be removed.
The office building to the south of the site may be suitable office for a Park District Unit or a Park Partner.

Existing Conditions Survey

Surveyed by: Nancy Malone, S&S; David Trachtenberg, DTA; by walk through and visual inspection.

Date: 3/17/15

Building: Magazine, "typical" of those in the vicinity of 1A-24

Location: 7th Street, Concord Naval Weapons Station

Current Use: Currently unoccupied

Former Use/s: Munitions magazine

Approximate size of Building and number of rooms:

One magazine space of approx. 520 sf; entryway/blast deflection space of approx. 575 sf

REVIEW OF RESOURCE:

Key: Excellent (E), Good (G), Fair (F), Poor (P)

Exterior Condition:

North Wall	Cast-in-place concrete, covered by earth, unable to view
South Wall	Cast-in-place concrete, (G)
East Wall	Cast-in-place concrete, covered by earth, unable to view
West Wall	Cast-in-place concrete, covered by earth, unable to view
Roof	Cast-in-place concrete, covered by earth, unable to view
Windows	None
Doors	Pair steel utility doors, (F)
Other	Cast-in-place concrete retaining walls, (G)

Exterior Industrial/military. Simple barrel form under earth, with access via retained blast area.

Character:

Interior Condition:

Wall type 1	End walls: Cast-in-place concrete, some effluorescence. (F)
Wall type 2	Side walls: Cast-in-place concrete (lower extent of vaulted ceiling). (G)
Wall type 3	Not used
Ceiling	Barrel shaped, cast-in-place concrete, minor effluorescence. (G) to (F). 12' high at peak.
Windows	None
Doors	Pair steel utility doors, (F)
Floor	Concrete slab. (G)
Other	Not used

Interior Character: Very simple industrial space; very quiet. The experience is a great contrast to the wide open landscape.

Structural System: Cast-in-place concrete walls and roof, most of building under earth. Floor is concrete and is assumed to be structural slab-on-grade. Concrete retaining walls outside the building.

Mechanical & Plumbing: N/A

Electrical & Lighting: N/A

Daylighting: None, except as admitted by open door

Views: None from the building itself. Outside building and blast area there are views to Mt Diablo and vicinity. Building 1A-24 is within the viewshed, as are a large number of magazines.

Surrounding Site: The site has a gradual slope, sloping to west.
It is part of an area holding a large number of magazines, arranged on a grid.

Opportunities & Constraints: The main space would be suitable for an interpretive exhibit or as part of an interpretive trail.

There is an abrupt drop from the top of the blast area retaining walls to grade below. It may be advisable to restrict visitor access to the floor level of the magazine so as to protect visitors from falls.

It appears that the slopes between this site and Building 1A-24 may allow for on-grade access between the two, although it would require analysis.

Notes: Utilities not currently active, therefore unable to evaluate building systems.

**CONCORD HILLS REGIONAL PARK
LAND USE PLAN | APPENDICES**

**APPENDIX C
EBRPD TRAIL CONSTRUCTION AND
TRAIL MODIFICATIONS BEST
MANAGEMENT PRACTICES**

EAST BAY REGIONAL PARK DISTRICT TRAIL CONSTRUCTION & TRAIL MODIFICATION BEST MANAGEMENT PRACTICES (BMPS)

Following are best management practices that will be employed to minimize adverse impacts to the parkland environment during trail construction, modification and/or restoration activities, as appropriate:

- Develop trails to contour alongside slopes (not the fall line of a slope) as fall-line trails become watercourses, erode easily and then are difficult to maintain. Contour trails should be cut on a full bench, rather than a combination of cut and fill. The cut material should be broadcast downslope, unless the trail is near a creek. Cut material can also be utilized for the ramp section of rolling dips if it is compacted one layer at a time.
- Out-slope trails in most cases (except for short sections at outside bends) to encourage water to run off the side of the trail, rather than along the trail. Trails should be built to have about 3 to 5 percent out-slope after trail compaction has occurred, so initial out-sloping should be greater than 5 percent. After a year or two, it should be expected that maintenance would be needed to return and “de-berm” sections of trail where soil compaction and displacement have exceeded the out-sloping.
- Incorporate rolling dips (grade reversals 12 to 20 feet long) that avoid the short and abrupt style of traditional “water bars” into a trail where they will enhance natural grade dips (as a backup to out-sloping) to avoid water flow along a trail.
- Locate the outside bend of a trail at a relative high point to help reduce erosion; a reduction in erosion is achieved because the upslope naturally slows a bicycle rider, which reduces the need to brake or skid, which can displace sediments on the trail surface.
- Locate climbing turns or switchbacks whenever possible where the side-slope is 10 percent or less, in order to create a sustainable, low-erosion trail. The actual trail gradient should be determined by site geology and terrain. The wider the turn and the lower the slope of the turn itself, the less braking and skidding (going downhill) is needed, and less wheel spinning (going uphill) is likely.
- Reduce locations where bicycles tend to brake heavily and or have to climb steep hills, which could cause erosion. Make a conscious effort to design trails with consistent “flow” (IMBA, 2004). Exaggerate grade reversals at outside bends. Gradual flow transitions should also reduce user conflicts.
- If landslides or slope failures occur, cut a temporary ramp through the edge of the scarp, have the trail traverse across the slide, and then cut another ramp to go up the scarp on the other side to reduce the tendency for users to create unsanctioned trails around the head of the landslide scarp.
- Close trails in areas with active landslides and highly erodible soils during wet weather and storm events.
- Maintain the trail corridor by trimming encroaching vegetation to keep trail in a safe and operable condition thereby encouraging users to stay within the constructed trail bed.

- Conform trail approaches as they intersect with other trails to reduce water collection at the junction and moderate the speed of trail users.
- Minimize disturbance to the soil surface to reduce erosion and maintenance problems; minimized trail widths to reduce the amount of bare soil subject to erosion and produce less concentrated runoff than wider trails (with all other factors being equal).
- Prepare specific erosion control plans as part of the trail construction documentation for new trail alignments. Criteria to be used in determining the erosion potential and developing the plan include: slope; soil type; soil composition and permeability; and the relative stability of the underlying geologic unit.
- Incorporate erosion- and sediment-control measures where trails are located in riparian zones to minimize the mobilization of sediment to creeks and other water bodies including:
 - Using paving stones or other rock work (to armor the trail surface).
 - Providing settling areas for trail drainage where water can infiltrate and sediment can settle out.
 - Constructing creek crossings so that they do not greatly alter the cross-sectional shape of the channel or floodplain.
 - Sloping the approach to a creek or drainage crossing downward toward the creek and then climbing upward when traveling away from the creek drainage bed, so that in the event of a blockage in the channel, the creek water would not be diverted to flow along the trail.
 - Enclosing and covering exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways.
 - Containing soil and filtering runoff from distributed areas by berms, vegetated filters, silt fencing, straw wattles, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from disturbed areas.
 - Prohibiting the placement of earth or organic material where it may be directly carried into a stream, swale, ditch, marsh, pond, or body of standing water.
 - Prohibiting the following types of materials from being rinsed or washed into waterways: concrete, solvents and adhesives, fuels, dirt, gasoline, asphalt, and concrete saw slurry.
 - Only conducting dewatering activities with implementation of proper construction water quality control measures in place.
- Use rock drains and gravel surfaces where trails cross seep areas to minimize potential for trail users to bypass the soggy area in ever-increasing arcs. Use soil amendments such as sand, crushed rock, or gravel to make a trail less prone to compaction and displacement; amendments can also help the tread drain better.
- Limit the source of water for horse troughs to seeps, springs and existing water lines; do not divert water from creeks or other waterways.
- Abandon, obliterate and restore trails where it has been determined that the trail would be a significant risk to park resources or safety of the park users. In these cases, the decommissioned trail will be:
 - Blocked with local native vegetation materials such as limbs, logs, rocks and brush (or fencing) that will be placed in such a way as to create obstacles for the trail user
 - Rehabilitated by filling and reshaping the former trail surface to blend with the natural contours. If soil compaction has occurred, the soil will be scarified and aerated.
 - Revegetated by planting native vegetation, transplanted from the vicinity, or seeded with native species found in the area.
 - Posted "*not a trail, habitat restoration taking place.*"

Once the obliteration and restoration has been completed, the decommissioned trail should be totally obscured, present a difficult and uncomfortable route to the potential trail user, and, if possible, the view of the trail blocked from a designated trail.

**CONCORD HILLS REGIONAL PARK
LAND USE PLAN | APPENDICES**

**APPENDIX D
DETAILED BIOLOGICAL RESOURCE
MANAGEMENT TASKS**

Detailed Biological Resource Management Tasks

This appendix provides additional description regarding the tasks identified in Chapter 4 for the management of biological resources at the future Concord Hills Regional Park. These practices conform with the Concord Reuse Project Area Plan On-Site Conservation Lands Long-Term Management Plan (2018) prepared for the East Bay Regional Park District by H.T. Harvey & Associates. This guidance is intended to convey the ongoing responsibilities of the Park District and its partners to protect the habitat and species at the former Concord Naval Weapons Station. A list of acronyms used in this appendix is available in Chapter 6 of the Land Use Plan.

1.1.1 AMPHIBIAN BREEDING PONDS

The management goal for ponds is to provide multiple aquatic habitats of varying hydrological conditions that are suitable for breeding by California red-legged frogs and Central California tiger salamanders in order to maintain populations of these species in the Regional Park.

Objective: Monitor and manage the Regional Park's potential breeding ponds for the benefit of the California red-legged frog and Central California tiger salamander

BIO 1. Inspect Cattle Exclusion Fencing and Associated Gates around Ponds

Inspect cattle exclusion fences and gates at all breeding ponds once a year. Look for gaps in the barbed wire or downed barbed wire, dislodged or broken fence posts, and spots where the barbed wire has detached from posts. Inspect the gates in the fencing to ensure that they are functioning correctly. If any of the fencing or gates need to be repaired, EBRPD will note and photograph problem areas to document the issues.

BIO 2. Inspect Pond Drying Period, Pond Berms/Dams, and Accumulation of Sediment and/or Excessive Emergent Vegetation

Monitor the water depth in each pond annually by reading the staff gauge and recording the water depth once per month starting in May and continuing until the pond dries (or through August, whichever occurs first). Once per year, inspect the integrity of the berm/dam of, and extent of sedimentation in, each pond and determine whether there is any need for repair of the berm/dam and/or removal of sediment. Specific conditions to look for in the berm/dam that may indicate problems are cracks, burrows, or leaks in the berms/dams, erosional spots on the berm/dam, head cut in the drainage downstream of the berm/dam that could migrate upstream to threaten the outfall, and flow of water around rather than through the outfall, which may cause erosion of the berm/dam around the outfall.

Some sedimentation is expected to occur naturally, but sediment accumulation should not be rapid unless erosional problems are occurring upslope from the pond. Specific indications of an increase in sedimentation that may quickly shorten the hydroperiod of the pond are unusually rapid and excessive accumulation of sediment from upstream erosion, or the trapping of sedimentation from an excessive increase in emergent vegetation. Any percent decrease in open water habitat due to an increase in emergent vegetation will also be estimated during inspections. After a pond dries (if seasonal), the staff gauge at the bottom of the pond will be read to determine how much sediment has accumulated in the pond. If EBRPD identifies any substantial change in the drying date, rapid sedimentation, excessive vegetation growth within the pond, or structural problems with dams or berms that will likely interfere with the pond's conservation values, EBRPD will note and photograph the problem areas to document the issues so the Land Manager can repair or maintain the ponds in accordance with BIO 4 or BIO 5.

BIO 3. Repair Cattle Exclusion Fencing and Associated Gates around Ponds

If exclusion fencing and associated gates are in need of repair to effectively exclude cattle from the enclosure areas at the ponds (or to allow for closely managed grazing of areas around the ponds), Repair these sections. Maintenance activities will include repairing gaps in the barbed wire or downed barbed wire, repairing fence posts, repairing connections of the barbed wire to the posts, and repairing gates as needed. Equipment that may be required includes a back hoe and post-hole excavator.

BIO 4. Repair Failing Berms/Dams

If a berm/dam of a pond has failed or will likely fail, repair the berm/dam. Repair will occur in the fall when it is expected that larvae of the California red-legged frog and Central California tiger salamander have metamorphosed out of the ponds and most of the ponds have dried (but it may occur in late spring or summer if the pond is completely dry). If repair of a berm/dam is to occur in a pond that contains water when the repair must be made, and the repair will affect the ponding of the water (cause the water to flow out of the pond) or require entry into the water by personnel or equipment, EBRPD will dewater the pond following the dewatering protocol in BIO 7 prior to repair activities.

Eroded berms/dams will be backfilled and compacted using equipment such as a backhoe and loader. Disturbed soil will be seeded for erosion control. Cracks or leaks in dams may be repaired by lining with bentonite, or other clay soil, or grout, using equipment such as loader, compactor, and grout pumper. Culverts may need to be installed in eroded spillways and backfilled with soil and riprap placed by machinery or hand. An approved biologist will monitor the pond dewatering and/or berm/dam repair activity per BIO 6.

BIO 5. Remove Accumulated Sediment and/or Excessive Vegetation from Ponds

During the monitoring activities in BIO 2, EBRPD will note whether a pond designated as a Central California tiger salamander breeding pond has lost 50% of its ponding capacity from the time it was enrolled into the long-term management program, or does not retain water after May 31st in a year of average or above-average rainfall; or whether a pond designated as a breeding pond for both species, or just for California red-legged frog, has lost 50% of its ponding capacity from the time it was enrolled into the long-term management program, lost 50% of open water due to an expansion of emergent vegetation, or does not retain water after July 31st in a year of average or above-average rainfall due to an accumulation of sediment. If any of these situations occurs, EBRPD will remove the sediment and/or the

excessive emergent vegetation in the fall when it is expected that larvae of the California red-legged frog and Central California tiger salamander have metamorphosed out of the ponds and most of the ponds have dried (but it may occur in late spring or summer if the pond is completely dry). If sediment/emergent vegetation removal is to occur in a pond with water, EBRPD will dewater the pond following the dewatering protocol in BIO 7 prior to sediment/emergent vegetation removal. The excess sediment/emergent vegetation will be removed using a suction pump (for sediment), excavator, or backhoe. EBRPD will dispose of removed sediment or emergent vegetation in a predetermined area that will not potentially affect dispersing or aestivating tiger salamanders or red-legged frogs (i. E., avoiding areas with rodent burrows). An approved biologist will monitor the pond dewatering and/or sediment/emergent vegetation removal activity per BIO 6.

BIO 6. Conduct Biological Monitoring during Selected Maintenance and Management Activities

Berm/dam repair (BIO 4), sediment/emergent vegetation removal (BIO 5), and pond drawdown for nonnative animal management (see BIO 22) are activities that have the greatest potential for resulting in injury or mortality of California red-legged frogs or Central California tiger salamanders because of their scale, because they focus on ponds where these listed species are expected to occur, and/or because of the nature of these activities. As a result, an approved biologist will monitor these activities to minimize the potential for harm of California red-legged frogs or Central California tiger salamanders. Within 7 days prior to any drawdown, berm/dam repair, or removal of silt, the work site will be surveyed by the biologist for the presence of individuals of the Central California tiger salamander or California red-legged frog. If water is present in the pond, the survey will involve using a dip net or a seine to sample the ponded water for larval individuals of the species. The approved biologist will survey for adults and post-metamorphic individuals of the California red-legged frog by conducting a nighttime survey the evening prior to initiating the activity and then again the morning of the activity. If the biologist detects individuals of any life stage of these species and determines that they are in harm's way, the biologist will capture and relocate these individuals to nearby appropriate aquatic or upland habitat per an established relocation plan. Once all individuals have been relocated to the extent feasible, the biologist will monitor during implementation of the repair activity. Once all individuals have been relocated to the extent feasible, the biologist will monitor during implementation of the repair activity. The biologist will be the contact for any employee or contractor who might inadvertently kill or injure a California red-legged frog, Central California tiger salamander, or Alameda whipsnake or anyone who finds a dead, injured, or entrapped individual of these species.

BIO 7. Implement Avoidance and Minimization Measures

The EBRPD will implement AMMs for the entire Regional Park. As noted above under BIO 6, EBRPD will also provide biological monitoring during BIO 4 (berm/dam repair), BIO 5 (sediment removal), and BIO 22 (nonnative animal management). In addition, EBRPD will implement the following measures to avoid and minimize impacts on sensitive wildlife and habitats during these three and other relevant tasks for which application of these AMMs would reduce adverse effects on California red-legged frogs or Central California tiger salamanders.

- Repair of failing berm/dam or cattle exclusion fencing around ponds, or removal of sediment/emergent vegetation from ponds (BIO 3 to BIO 5) will occur between September 1 and October 15 (or until the first measurable fall of rain of 1 cm) unless the pond is otherwise dry, in

which case it may occur between the time in which the pond dries in late spring or summer and October 15 (or until the first measurable fall of rain of 1 cm).

- Any pond that contains water when berm/dam repair or removal of sediment/emergent vegetation is necessary will be drawn down so that it is dewatered prior to the activity. EBRPD will implement the following measures as applicable during dewatering:
 - Equipment and machinery will be inspected and cleaned of nonnative invasive vegetation prior to on-site use.
 - Water diversion techniques will allow stream flows to gravity flow around or through the work site if feasible.
 - If a work site must be dewatered by pumping, intakes will be screened with wire mesh screening not to exceed 3/32 inch. Pump intakes will be placed in perforated intake basins to allow water to be drawn into the pump while protecting aquatic organisms. Both the outside of the intake basin and the pump intake itself will be screened to ensure that aquatic organisms are not pulled into the pump.
 - Water will be released or pumped downstream/downslope at an appropriate rate to maintain downstream flows during construction and will be discharged in a non-erosive manner (e.g., gravel or vegetated bars, on hay bales, etc.).
 - An approved biologist will be on-site to monitor all dewatering activities and check the dewatered area for listed species. If listed species are found within the work area, the approved biologist will relocate them according to the approved species relocation plan (Appendix B).
 - No water will be allowed to contact uncured concrete or mortar. If any wet concrete, cement, slurry, or washings thereof inadvertently enter the stream, all construction activities shall immediately cease until the material is cleaned up and removed from the channel.
- To minimize the spread of pathogens all individuals working in aquatic habitat (biological monitors, surveyors, construction personnel, etc.) EBRPD will adhere to “Recommended Equipment Decontamination Procedures”, which is in Appendix B of the USFWS’s August 2005 “Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog”, or then-current protocol.

Unless off-road travel is required to access the ponds, vehicles will be restricted to roads. If off-road travel is needed to deliver equipment and supplies to the ponds, EBRPD will determine the path of travel and area of work and laydown to avoid wetlands, sensitive habitats (i. E., scrub habitat), and ground squirrel burrows to the extent feasible.

Adaptive Management/Contingency Measures

If it is observed that a pond consistently fails to provide suitable breeding habitat for the California red-legged frog and/or Central California tiger salamander (i. E., because it is too shallow or has an insufficient hydroperiod) over 3 years of average or above-average rainfall, even after the tasks above (such as berm/dam inspection and repair or sediment removal) have been implemented as necessary, EBRPD will investigate the cause of the problem more closely, obtaining the assistance of a hydrologist if necessary. EBRPD will obtain the assistance of a hydrologist if necessary. Potential problems may include inadvertent diversion of runoff that formerly drained to the pond (e.g., from upslope slumping), an increase in

percolation, a leaky berm/dam, or other factors. EBRPD will evaluate potential additional measures that may resolve the issue (e.g., lining the bottom of the pond with clay soils or bentonite, or deepening the pond), and with approval of the Reviewing Agencies will initiate these measures until the issue is resolved.

1.1.2 UPLAND HABITAT MANAGEMENT

Prior to European settlement in the 1700s, most of California was dominated by native forbs or shrubs, with limited expanses of “grassland” (Heady et al. 1991) (Schiffman 2007, Minnich 2008, Hopkinson and Huntsinger 2005). The shift from forb or shrub dominated plant communities to annual grass dominated plant communities across much of California has adversely affected habitat values for many species of native wildlife. In areas that potentially provide upland habitat for the Central California tiger salamander and the California red-legged frog, the accumulation of dense, annual grass biomass (known as RDM) may impede amphibian movement through uplands surrounding breeding ponds. Additionally, accumulated annual grass biomass reduces habitat suitability for some species of small mammals (Fitch and Bentley 1949) that excavate burrows used by Central California tiger salamanders for upland refuge. Because of these relationships between RDM and habitat suitability for California red-legged frogs and Central California tiger salamanders, targeted livestock grazing is recommended to manage the Regional Park’s upland habitats that support both species (Ford et al. 2013).

While flexibility is a primary requirement of any targeted livestock grazing program, livestock producers, upon whom the success of a targeted grazing program relies, require a certain amount of predictability to manage their livestock. Depending on the configuration of their overall livestock, general economic trends in livestock markets, the availability of substitute forage, and similar factors, livestock producers may have limited flexibility to make rapid changes to their grazing operations in response to changes in forage production. Approaches to habitat management that rely on targeted livestock grazing must therefore balance the need for flexibility, to respond to unpredictable changes in forage production, with the need for a certain amount of predictability.

This targeted grazing approach is designed in consideration of these factors. It emphasizes a flexible and adaptive approach to maintaining habitat values for California red-legged frogs, Central California tiger salamanders, and burrowing mammals through the reduction of RDM to levels that support these species and their habitats. While this approach emphasizes these species, it will also benefit other special-status species, such as burrowing owls, which rely on California ground squirrels to create suitable roosting habitat (i. E., burrows), and golden eagles, for which ground squirrels are a major prey species.

A specific objective and related tasks that will guide implementation of a flexible and adaptive approach to upland habitat management are described below.

Objective: Manage, enhance, and monitor upland habitat for the benefit of the Covered Species

BIO 8. Establish RDM Targets

Long-term management of upland habitats will include developing RDM targets for the Regional Park that are calibrated to provide ongoing suitable upland habitat conditions for the Covered Species and periodically adjusting these targets as needed. After considering the factors that influence the initial RDM target, the target RDM range for the Regional Park, as measured in the fall prior to the first germinating

rainfall (0.5 inch to 1.0 inch of rainfall over a 7-day period of time [Becchetti et al. 2016]), will initially emphasize retaining a “moderate” amount of RDM, ranging from approximately 500 – 1200 lbs/ac on flat slopes to approximately 1200 - 2000 lbs/ac on hillsides approaching or exceeding 40% slope. This target range was developed in consideration of the following factors.

- Protection of basic rangeland resources such as soil quality, forage production, and water quality. For areas similar to the Regional Park, the University of California Cooperative Extension Service recommends a minimum RDM of 500 lbs/ac in flat areas to up to 800 lbs/ac in steep areas exceeding 40% slope (Bartolome et al. 2006). These RDM targets are minimum amounts needed to minimize soil erosion and to encourage forage production in subsequent years, rather than being indicative of “ideal” RDM amounts to provide suitable habitat conditions for any particular plant or wildlife species.
- Ease of movement for California red-legged frogs and Central California tiger salamanders among breeding ponds and between breeding ponds and upland refugia. There are no documented RDM levels that have been objectively shown to facilitate movement of the Covered Species through grasslands; however, the general consensus is that some amount of livestock grazing is appropriate to enhance grassland communities for both species given that particularly dense vegetation may impede their movement (Ford et al. 2013).
- A desire to encourage California ground squirrels, because they create burrows used by Central California tiger salamanders. In general, California ground squirrels show an affinity for areas grazed by livestock (Fitch and Bentley 1949). Similar to observations of the relationship between livestock grazing and habitat for California red-legged frogs and Central California tiger salamanders, some amount of livestock grazing likely benefits California ground squirrels.
- The ponding duration of amphibian breeding habitats, particularly seasonal wetlands used by Central California tiger salamanders for breeding. Research examining the effects of livestock grazing on seasonal wetlands elsewhere in California (i. E., Central Valley vernal pools) has shown that continuously grazed wetlands (wetlands grazed from October - June) remained ponded significantly longer than both ungrazed wetlands (Marty 2015) and wetlands that were not continuously grazed during this period of time (Marty 2005). Particularly in years with below-average precipitation, this increase in ponding duration for continuously grazed wetlands may be even more pronounced (Marty 2015) and ecologically significant for species such as California red-legged frogs and Central California tiger salamanders that require certain ponding periods to complete their development (Pyke and Marty 2005). Although the effects of grazing on biomass reduction vary among years (based on the amount of precipitation), the continuously grazed treatments in these studies always resulted in lower RDM values relative to the no-grazing control and other grazing treatments that were not continuously grazed (Marty 2015, Marty pers. comm.).

The EBRPD may adjust this target range through time, as described in “Adaptive Management/Contingency Measures” below, based on site-specific data or other information related to upland habitat management approaches that benefit the wildlife species addressed in Chapter 4.

BIO 9. Prepare an Annual Operating Plan

Prior to the start of a new grazing season, and by October 15 annually, the grazing lessee will prepare an annual operating plan (AOP) for review and approval by the EBRPD. The AOP will include the following information: the kind, class, and number of livestock to be grazed in the Regional Park; a proposed pasture rotation schedule, including the numbers of livestock to be grazed in each fenced pasture and the dates during which grazing will occur in each pasture; the brand registration for all livestock to be grazed in the Regional Park; the locations and types of mineral and nutrient supplements to be placed in the Regional Park; any resource-specific, targeted livestock grazing proposed for the year (e.g., to manage invasive plant infestations); and any proposed fencing or water improvements or repairs planned for the coming year. The AOP will be reviewed by the EBRPD, discussed with the grazing lessee and modified as needed, and approved by EBRPD within 30 days of submittal.

BIO 10. Regularly Estimate Biomass

The EBRPD will estimate the amount of standing biomass in upland areas in the spring (March or April), at or around the period of peak forage production, and again in the summer (approximately July). Estimates will be recorded at established grassland monitoring plots sited to represent differing geographic areas, soil types, slopes/aspects, and distances from water sources. T

Monitoring plots have been selected that are representative of the surrounding area (i. E., in an area with similar soils, vegetation, slope, and aspect), and capable of responding similarly to grazing management. Most key monitoring plots have been established in areas that are expected to receive “typical” livestock use (i. E., a level of livestock use that is representative of the larger management unit). Several key monitoring plots were established in low-livestock-use areas (e.g., near wetlands or riparian habitats) and high-use areas (e.g., near livestock watering areas) to better document the actual range of grazing that will be occurring on large diverse management units. EBRPD may modify the location and number of reference sites over time in response to changing resource conditions or changes in grazing management.

The EBRPD will record visual estimates of biomass at each key plot using standard methods (e.g., Bartolome et al. 2006, Wildland Solutions 2008). Clipping and weighing of forage samples will not be required, although EBRPD may collect and weigh samples if deemed necessary to calibrate site-specific visual estimates of herbaceous biomass. The purpose of visual biomass estimates is to predict when fall RDM targets will be reached so that livestock can be removed (or added), as necessary, to meet annual targets. Depending on the timing of surveys, EBRPD may estimate fall RDM from earlier biomass samples by assuming roughly 7% degradation per month in the absence of any additional livestock grazing (Frost et al. 2005).

During these biomass estimation surveys, EBRPD will also document areas of excessive bare ground, erosion, and invasive plant infestations so that these issues can be proactively addressed with the grazing lessee under BIO 12. Noteworthy site conditions, including representative conditions at each key plot, will be photographed as appropriate.

BIO 11. Provide Flexibility for Managing Livestock in Response to Annual Climate

As discussed above, grassland forage productivity can vary dramatically from year to year in California’s grassland and woodland plant communities. To consistently meet RDM goals there must be flexibility for the grazing lessee to increase or decrease (often with relatively limited advance notification) either the

numbers of livestock, the period of grazing, or both. This degree of flexibility is difficult for most grazing lessees.

To help support this flexibility, EBRPD will denote specific pastures as Flexible Use Fields. In these Flexible Use Fields, the grazing lessee will be expected to meet RDM targets 3 out of every 5 years because these pastures generally provide lower-quality California red-legged frog and Central California tiger salamander habitat. Depending on forage conditions, these pastures may be grazed more heavily (e.g., in a drought year, when animals must be removed from other pastures and held in the Flexible Use Fields) or more lightly (e.g., in a year with excessive forage production, when more animals must be grazed for a longer period of time in those pastures not designated as Flexible Use Fields). Management of Flexible Use Fields will be closely coordinated between EBRPD and the grazing lessee.

BIO 12. Adjust Stocking Rates and Pasture Rotations

Based on inspections conducted in BIO 10, EBRPD and grazing lessee will work together throughout the grazing season to proactively adjust the AOP, as needed to meet RDM targets in each pasture (except Flexible Use Fields) and to address other management issues, such as excessive bare ground or pest plant infestations. Adjustments may include adding or removing animals; adjusting the grazing duration in specific pastures; adding, removing, or relocating mineral or nutrient supplements; constructing temporary electrical fencing to concentrate animals in specific parts of larger fenced pastures or exclude animals from specific locations; manipulating water sources; moving animals into or out of Flexible Use Fields; and other strategies to manage livestock as needed to achieve RDM targets, minimize excessive bare ground, and manage pest plant infestations.

BIO 13. Manage Grazing around Ponds to Maintain or Enhance Habitat

The EBRPD will work with the grazing lessee, both during the development of the AOP and throughout the grazing season, to manage livestock grazing in and around ponds. The objective of grazing, and the desired condition in and around each pond, will vary depending on whether the ponds support breeding only by the Central California tiger salamander or by both amphibians. For example, livestock grazing in and around aquatic habitats that potentially support only the Central California tiger salamander will be encouraged more, to reduce density of vegetation and increase turbidity (to reduce predator detection of larval Central California tiger salamanders), than at ponds where California red-legged frogs may also breed, and where more vegetation will be left in and around ponds to provide egg mass attachment sites and cover for frogs.

Appropriate, targeted grazing strategies may include early season “flash” grazing (e.g., November – December) to reduce growth of newly-germinated grasses; mid-season grazing (e.g., February – April), at a relatively low stocking rate, to encourage additional forage utilization and use of breeding ponds as sources of livestock water (to increase turbidity and reduce predator detection of larval Central California tiger salamanders); or late season grazing (summer – fall) to reduce biomass levels to RDM targets, after Central California tiger salamander metamorphosis. EBRPD will monitor grazing within fencing around ponds closely enough to ensure that cattle are excluded from the ponds (simply by closing the gates) when the target habitat conditions have been achieved.

BIO 14. Add New Fencing for Grazing Management, Add or Relocate Livestock Watering Infrastructure

In addition to the new or reconfigured fencing that will be added around amphibian breeding ponds, as described in the HMMP, fencing will be added in the area south of the Lower Cistern Pond to separate two pastures to facilitate managed grazing, and in one area along the interface between the Regional Park and the EDC Area.

Sufficient livestock watering infrastructure already exists to support upland habitat management of the Regional Park. However, new livestock water sources could facilitate improved upland habitat management, particularly along the ridgeline that generally defines the northeastern border of the Regional Park. In many of these areas, livestock water is lacking. Increasing the number of water sources would provide more flexibility in managing livestock and more flexibility in managing the use of ponds (such as the Hilltop Ponds) as livestock watering areas, and would likely support attainment of RDM targets in these areas more regularly than would be expected without more water sources (i. E., under current conditions).

The locations for new livestock troughs would depend on accessibility for construction and maintenance, logistical constraints, overall water availability, and similar considerations, and the need for adding or relocating troughs to those locations will be determined over time by EBRPD and grazing lessee. EBRPD will confer with the grazing lessee to determine whether and where additional livestock water sources would be beneficial and feasible, and a prioritized plan for constructing the most beneficial water sources will be developed and implemented. All livestock water sources will include a wildlife escape ramp. If necessary to improve grazing effectiveness, EBRPD and grazing lessee will also discuss whether and where salt and mineral supplements should be placed and will locate them accordingly.

BIO 15. Inspect, Maintain, and Repair Fencing and Livestock Watering Infrastructure

During the monitoring described in Tasks BIO 1 and BIO 10, EBRPD will inspect all fencing, signage, livestock water sources, and corrals to assess their functionality and maintenance needs, and will notify the grazing lessee when the grazing infrastructure needs to be repaired. The grazing lessee will also inspect this infrastructure during onsite grazing management activities, and repair the infrastructure as needed.

The grazing lessee will repair all corrals, fencing, and signage as follows.

- Fencing in poor condition with missing posts and sagging wire will be removed and re-constructed.
- Fencing in fair or good condition will be repaired as needed (e.g., posts straightened or added, wires tightened).
- If fencing is removed, fence posts may be removed, re-used for the construction of new fence segments (for posts in good condition), or left in place to provide a source of perches for birds. Wire will be collected and disposed of at an approved off-site landfill or other authorized location.
- Signs restricting public access will be maintained to have at least one sign every 1,000 feet along perimeter fencelines and at every exterior gate.
- Gates will be maintained to be functional. Rusted, bent, or otherwise non-functional gates will be replaced. All gates will be locked to deter trespass.

- At each corral, rusted or inoperative equipment will be replaced; sagging or downed panels will be corrected; and, the general area will be maintained to be free of trash and debris.
- Each trough will be maintained to prevent overflow and leaks and to minimize the potential for soil erosion (e.g., by placing rock or similar materials immediately surrounding the trough). Overflow from troughs will not be directed into wetlands or other waterbodies.

BIO 16. Assess and Map RDM

To assess whether or not established targets are being met, EBRPD will measure RDM at each established key grassland monitoring plot in the fall prior to the first significant rain events of the season. Methods used to measure RDM at each plot will be similar to those described under BIO 10, except that more precise estimation of RDM is expected during fall surveys, and an estimate of fossorial rodent activity in each key grassland-monitoring plot will also be recorded.

Additionally, EBRPD will prepare RDM zone maps for the Regional Park following standard methods (Frost et al. 1988, Wildland Solutions 2008). As a general rule, RDM zones should be no smaller than 20 acres, unless smaller zones are warranted to adequately characterize resource conditions. EBRPD will maintain GIS data on the RDM zones to facilitate analysis and comparison of data among different years. The Regional Park has a variety of soils, aspects, and vegetation types, which is likely to result in non-uniform livestock use, particularly within larger management units. Delineation of boundaries between different zones requires careful interpretation when developing zone maps. A combination of reference photographs, descriptive narratives (Bartolome et al. 2006, Wildland Solutions 2008), and (if necessary to calibrate visual RDM estimates) clipping and weighing biomass within representative areas are all helpful tools to determine zone boundaries and to assign a specific biomass class to each zone. Zone boundaries are delineated where one zone "mostly" shifts to another zone; in practice, zone boundaries are typically delineated by topographic breaks in slope and changes in aspect or changes in soil types that are relatively easy to map in the field (Wildland Solutions 2008).

The EBRPD will include a copy of the RDM zone map and results of fall RDM monitoring in an annual report BIO ..

Adaptive Management/Contingency Measures

As described above under BIO 12, regular estimation of biomass will inform adjustments to the AOP throughout the grazing season as needed to meet RDM targets. Additionally, if through collection of fall RDM data (BIO 16), in combination with species-specific monitoring data collected in BIO 23 and BIO 24, population trends for California red-legged frogs or Central California tiger salamanders appear to be reasonably related to grazing management (i. E., because of habitual and inappropriately heavy or light grazing) and not a factor of regional (e.g., drought) or larger scale (e.g., climate change) environmental conditions, EBRPD and grazing lessee will work together to develop grazing strategies that will better meet RDM targets and support populations of both species. EBRPD may also revise RDM targets based on monitoring results, if necessary to improve populations of the Covered Species, reduce erosion, or otherwise improve ecological conditions (or if necessary as a result of long-term factors such as climate change). EBRPD will describe any recommendations for modifying RDM targets or grazing strategies to meet targets in an annual report.

1.1.3 NONNATIVE INVASIVE PLANT SPECIES MANAGEMENT

Invasive plants, or “weeds”, are typically associated with disturbance, can be spread by vehicles and other anthropogenic means, and can create monocultural stands that severely reduce the habitat function and quality for both native plant and wildlife species, including California red-legged frogs, Central California tiger salamanders, and Alameda whipsnakes. Weeds, as defined for this appendix, do not necessarily include all species of nonnative grasses and forbs, many of which have become naturalized within California’s grassland habitats over the last 200 to 300 years and control of which would be impossible. Rather, we use “weeds” to refer to invasive plant species that cause particularly detrimental ecological impacts. A number of invasive plants have been recorded in the Reuse Area, including the Regional Park, during previous surveys (Vollmar Consulting 2008, H. T. Harvey & Associates 2015). If not managed, these species all have the potential to adversely affect habitat values for the California red-legged frog and Central California tiger salamander.

Two specific objectives and multiple tasks related to the management of these, and other, weeds in the Regional Park are described below.

Objective: Minimize the spread of existing nonnative invasive plants

BIO 17. Assess the Extent and Abundance of Invasive Plants

Concurrently with surveys described in BIO 10 and BIO 16, EBRPD will assess the extent and abundance of weeds. Significant infestations of weeds (more than several tens of square meters) will be mapped and photographed wherever they are observed, with an emphasis on new occurrences of particularly invasive weeds and other substantial changes from baseline conditions described during performance of Task INT-9. During these surveys, EBRPD will also re-visit prior weed treatment sites (see BIO 19) for a minimum of 3 years following treatment to assess the effectiveness of prior treatments, the need for additional treatment, and to photograph current conditions, as a visual comparison to similar photographs captured following weed treatment.

Additionally, at each key grassland-monitoring plot, EBRPD will record the occurrence and abundance of all weeds and photograph representative occurrences to visually document population changes over time. If any new species or occurrences of weeds are detected, they will be mapped, added to the GIS inventory, and prioritized for future treatment by EBRPD as described in BIO 17.

The EBRPD will include a summary of all weed monitoring methods, results, and specific recommendations for continued weed control strategies for the upcoming year in an annual report BIO , along with maps depicting any revisions to the invasive plant inventory.

BIO 18. Prioritize Populations of Invasive Plants for Treatment

EBRPD will review the GIS-based weed inventory created and annually will review the results of ongoing long-term monitoring as described in BIO 17 and develop priorities for weed treatment. High-priority infestations will include:

- infestations along roads or other major travel corridors, ponds or other waterbodies, and areas that are habitually utilized by livestock;

- infestations of new or incipient species that have a limited distribution within the Regional Park or regionally;
- infestations of species that, by nature of their biology and ecology, have a high potential to spread and cause ecological damage (i. E., species rated as “High” by the California Invasive Plant Council [Cal-IPC] or similar species determined by EBRPD to pose a significant ecological risk); and
- infestations of species that, through monitoring conducted to support other biological resource management tasks, are reducing habitat quality for the Covered Species.

Additionally, identification of high-priority weed infestations may be informed using decision support tools such as WHIPPET (<http://whippet.cal-ipc.org/pages/view/guide>). Based on this assessment, EBRPD will designate high-priority treatment sites to be addressed under BIO 19. EBRPD will review (and revise as appropriate) the prioritization of weed treatment needs on an annual basis.

BIO 19. Treat High-Priority Infestations of Invasive Plants

Species-specific weed treatment strategies are described in a variety of publications (DiTomaso and Healy 2007, DiTomaso et al. 2013). EBRPD will consult these sources of information, and other appropriate resources, to develop and implement treatment strategies for high-priority weed infestations. Treatment of high-priority infestations will occur annually, at the appropriate time of year for the species in question.

In general, EBRPD will use hand removal or small hand-powered or handheld equipment (such as a string trimmer) whenever possible to control invasive plant populations. These methods are usually only cost effective and efficient when treating small populations of a few plants that can be removed by hand or are easily controlled by cutting or other mechanical means. If hand-removal methods prove to be ineffective or the infestation is too widespread for hand removal to be practical, more intensive mechanical methods, such as mowing, will be evaluated. EBRPD will coordinate with the Reviewing Agencies before using any equipment with the potential to adversely affect special-status species or habitats, such as wetlands or drainages. Any plant parts remaining following weed treatment will be collected and disposed of by EBRPD when necessary to prevent the unintended spread of seeds and other weed propagules.

Targeted livestock grazing may also be used as a weed control strategy. The use of livestock to manage weeds must be carefully timed and planned so that grazing occurs during growth periods when plants are most susceptible to defoliation. The strategic use of mineral supplements or other supplements, electrical fencing, and temporary water sources may also be required to enable targeted livestock grazing of specific weed infestations. EBRPD will develop strategies using livestock to treat weeds in coordination with the grazing lessee as appropriate.

Herbicides are not recommended anywhere in the Regional Park due to the possibility of negative effects on sensitive amphibians. If weed infestations become severe at the Regional Park and cannot be controlled by mechanical means, EBRPD will prepare a plan that may include herbicides to treat weeds. The plan will include standard measures to minimize the potential for adverse effects of herbicide use on non-target species, such as requiring a licensed applicator, following label directions, and not spraying during windy conditions or when rain is predicted, as well as measures specific to the area where herbicide needs to be applied. The Plan will also include an analysis of exposure and effect of the

herbicide on listed species. EBRPD will submit the plan to the Reviewing Agencies for review. No activities would occur without Service approval of the plan.

EBRPD will maintain a weed control log that will describe all weed treatments completed during a given year. The log will be used to record populations targeted for control, methods used for control, when control activities took place, climatic conditions during the treatment, when the population was revisited to assess efficacy, photographs of the treatment sites prior to and following treatment, and the results of each of these actions. EBRPD will include a copy of this log as an appendix to the annual report.

Objective: Prevent the unintentional introduction and spread of weeds

BIO 20. Integrate Best Management Practices into all Habitat Maintenance and Management Activities

When seeds or other propagules of invasive plants are carried on equipment, clothing, or boots, or inadvertently carried onto the Regional Park in construction or maintenance materials, the invasive species can be spread into and throughout the Regional Park. EBRPD will implement standardized best management practices, such as those described in *Preventing the Spread of Invasive Plants: Best Management Practices for EBRPDs* (Cal-IPC 2012) or similar guidelines, during all activities as appropriate to prevent the inadvertent introduction and spread of invasive plants throughout the Regional Park.

Adaptive Management/Contingency Measures

As described above under BIO 17, regular assessment of weeds will inform adjustments to management strategies from year-to-year. Additionally, if through collection of species-specific monitoring data in Tasks BIO 23 and BIO 24, population trends for California red-legged frogs or Central California tiger salamanders appear to be reasonably related to weed populations (i. E., because of increasing distribution or abundance of weeds) and not a factor of regional (e.g., drought) or larger scale (e.g., climate change) environmental conditions, EBRPD will develop and implement new strategies intended to more effectively target those weed populations.

If control methods are not adequately restricting the spread of invasive plant species from one year to the next, EBRPD will vary the control methods or increase the intensity of control measures to improve effectiveness of control. EBRPD will describe control efforts, any recommended changes in control methods, and changes in high-priority populations or species targeted for treatment in an annual report. If more intensive management techniques, such as herbicides or prescribed fire, are recommended by the EBRPD, they will be subject to prior review and approval by the Reviewing Agencies along with any other applicable permitting or approval requirements (e.g., Bay Area Air Quality Management District approval).

1.1.4 NONNATIVE ANIMAL SPECIES MANAGEMENT

Nonnative fish, crayfish, and in particular bullfrogs could potentially threaten the conservation values of the Regional Park. Thus, the intentional introduction of fish, crayfish, or bullfrogs onto the Regional Park will be prohibited. Nevertheless, EBRPD may need to control or remove nonnative animals if their numbers in perennial ponds (the only ponds where fish and crayfish can survive and where bullfrogs can breed successfully) threaten the breeding potential of California red-legged frogs and Central California

tiger salamanders in those ponds. The following tasks will accomplish the goal of minimizing the impacts of invasive animal species on the California red-legged frog and Central California tiger salamander.

Objective: Maintain amphibian breeding ponds free from fish, and minimize bullfrog and crayfish numbers in ponds

BIO 21. Conduct Nonnative Animal Observations

During BIO 1 to BIO 7, as well as during periodic larval or adult monitoring surveys for California red-legged frogs (BIO 23) and periodic larval monitoring surveys for Central California tiger salamanders (BIO 24), EBRPD will record the number of individual nonnative predatory species, such as bullfrogs, crayfish, or fish, observed. If bullfrogs (including tadpoles), crayfish, or fish are captured during these tasks, they will be immediately dispatched by the approved biologist to prevent competition with, and predation on, the target amphibian species.

BIO 22. Perform Nonnative Animal Management

In addition to the removal of nonnative animals described in BIO 21, which will occur when bullfrogs (including tadpoles), crayfish, or fish are captured during other tasks, three types of nonnative animal management will be implemented depending on need: removal of bullfrogs, crayfish, and fish by seine or dipnet; nighttime surveys for (and removal of) adult bullfrogs; and/or drawdown of ponds to remove bullfrog tadpoles, crayfish, and fish. Because the simplest method to capture individuals of these species for removal is by seine or dipnet, that approach will be attempted first. However, this approach is likely to be effective only in relatively small or shallow ponds.

If bullfrogs are observed in any pond during BIO21, BIO 23, or BIO 24, and ponds are too large or deep for removal of individuals via seine or dipnet, then nighttime bullfrog removal via a combination of gigging netting (and dispatching of captured bullfrogs), and removal by experienced personnel using air rifles, will occur at each pond that contains bullfrogs. This bullfrog removal will be performed by an approved biologist before May of each year that bullfrogs are detected in Tasks BIO BIO 21, BIO BIO 23, or BIO BIO 24 or before May of the following year if the bullfrogs were detected in the summer or fall.

Drawdown of a pond may be necessary to control nonnative animals if (a) surveys conducted according to Tasks BIO BIO 21, BIO 23, or BIO 24 determine that fish, crayfish, and/or bullfrog tadpoles are present in one or more of the existing California red-legged frog and/or Central California tiger salamander breeding ponds in the Regional Park; and (b) removal of adult or juvenile bullfrogs as described above does not reduce the number of bullfrogs in a pond to baseline conditions; and (c) gigging and netting are inadequate to allow for the removal of bullfrogs from a pond. EBRPD will draw down the pond in which nonnatives need to be controlled in September or October after larvae of the California red-legged frog and Central California tiger salamander have metamorphosed, leaving bullfrog tadpoles (that typically require two seasons to develop and metamorphose), crayfish, and/or fish in the pond. The drawdown will be conducted using a pump following the AMMs for drawing down a pond in BIO 7 to prevent aquatic organisms from being drawn in. An approved biologist will monitor the drawdown to ensure that California red-legged frogs or Central California tiger salamanders are not harmed by the drawdown activity. The approved biologist will follow the AMMs in BIO 7 and actively survey for larvae of the California red-legged frog and Central California tiger salamander prior to and during the drawdown. If larvae of the California red-legged frog or Central California tiger salamander are detected, the approved

biologist will capture and relocate these larvae to nearby appropriate aquatic habitat per the approved relocation plan (Appendix B). Any bullfrog larvae, fish, or crayfish detected during the drawdown will be dispatched, and the pond will be kept dry long enough (e.g., at least a few days) to ensure that any remaining individuals have died.

Adaptive Management/Contingency Measures

If, after conducting nonnative animal management in BIO 22 of the ponds that contain these nonnative species, the ponds continue to contain these nonnative species, EBRPD will review nonnative animal management procedures to determine how removal of nonnatives can be made more effective. With the assistance of the Reviewing Agencies and species experts, EBRPD will evaluate potential factors that may have contributed to persistence of these nonnative species in the ponds after control attempts (e.g., reintroduction of fish species by the public, or unimpeded dispersal of bullfrogs or crayfish to a pond from a source population). EBRPD will identify adaptive management measures (e.g., further restricting public access to a pond, or control of nonnatives at an off-site source) to address these factors and continue to implement adaptive management strategies until the causal factors of these species' presence are resolved.

1.1.5 CALIFORNIA RED-LEGGED FROG

The goal for long-term management is to maintain suitable breeding, aquatic foraging, and upland habitat for the California red-legged frog, and monitoring will be used to document presence, characterize relative abundance population sizes, distribution, and pond breeding status of the California red-legged frog in the Conservation Area to help direct management decisions on these breeding and upland habitats.

Objective: Maintain and increase California red-legged frog presence, relative abundance, and distribution

BIO 23. Conduct Surveys for California Red-legged Frog Presence and Breeding

During the Central California tiger salamander surveys in BIO 24, EBRPD will also conduct surveys for California red-legged frog tadpoles, juveniles, subadults, and adults in all of the Regional Park ponds. The methodology will follow the approach detailed in Task INT-20 (i. E., using dip net sweeps or seining combined with visual encounter surveys). If during the April survey, no California red-legged frog tadpoles are detected in a designated California red-legged frog breeding pond (e.g., Lower Cistern Pond, newly created Pond 3), then a second survey will be performed in May at this pond if it contains standing water in accordance with the 2005 survey guidance. EBRPD will deem breeding to have been successful in a pond in any given year if well-developed tadpoles (i. E., tadpoles that are large and/or near metamorphose stage) are detected in the pond, and enough water remains to support metamorphosis.

EBRPD will include detections of all aquatic and amphibious species in an annual monitoring report and will report detections of special-status species to the CNDDDB. EBRPD will use results of the surveys to assess the effectiveness and success of the habitat enhancement and management activities and to identify adjustments that may need to be made to long-term habitat management practices.

Adaptive Management/Contingency Measures

If surveys in BIO 23 indicate absence of California red-legged frog breeding in a pond in which the species previously bred, or indicate that tadpoles were not able to successfully metamorphose from a pond in which they bred successfully in prior years, EBRPD will investigate potential causes for this result. For example, the year of the survey may be a year of below-average rainfall, which could inhibit breeding attempts or reduce ponding hydroperiod. In that case, no adaptive management may be necessary. If the survey was conducted during a year of average or above-average rainfall and California red-legged frog tadpoles were absent, EBRPD will review all pond, infrastructure, and vegetation monitoring results and management measures that are specific to that pond (e.g., pond hydroperiod and water depth inspections, sediment removal, fencing/berm inspection and repair, nonnative aquatic predator monitoring and removal) and the upland habitat around that pond (e.g., grazing practices, RDM targets, and invasive plant species monitoring and removal). With the assistance of the Reviewing Agencies and species experts, EBRPD will evaluate potential causal factors leading to declines in successful breeding and develop adaptive management and monitoring strategies to reverse any adverse conditions that may be negatively affecting populations of California red-legged frogs in the Regional Park, and continue to implement adaptive management until the causal factors leading to the absence are resolved. Conversely, after the first 12 years of long-term management (with surveys for California red-legged frogs and California tiger salamanders occurring every 3 years), if monitoring indicates that the relative abundance of these species in the Regional Park are stable or increasing, the frequency of surveys will be reduced to every 5 years.

1.1.6 CENTRAL CALIFORNIA TIGER SALAMANDER

The goal for long-term management is to maintain suitable breeding and upland habitat for the Central California tiger salamander, and monitoring will be used to document presence and characterize relative population sizes and distribution of the Central California tiger salamander in the Regional Park to help direct management decisions regarding these breeding and upland habitats.

Objective: Maintain Central California tiger salamander presence, relative abundance, and distribution

BIO 24. Conduct Regular Surveys for Central California Tiger Salamander Breeding

EBRPD will conduct larval surveys every 3 years (at least for the first 12 years of long-term management) in late April at all potential breeding ponds to detect evidence of Central California tiger salamander breeding.¹ The survey methods will be as described in Task INT-22. If during the April survey, no Central California tiger salamander larvae are captured in a pond then a second survey of that pond will be performed in May if the pond continues to contain standing water. If nonnative aquatic predators, such as bullfrogs or fish are observed or captured during the surveys, they will be recorded and dispatched as appropriate by the approved biologist (see BIO 21).

EBRPD will deem breeding to have been successful in a pond in any given year if well-developed larvae (i. E., larvae that are large and/or near metamorphose stage) are detected and enough water remains to

¹ The EBRPD will conduct these surveys at the 11 existing ponds, the three to four new ponds to be constructed per the HMMP, and any other pools that were found to support breeding Central California tiger salamanders during a prior survey, such as the baseline survey described in Task INT-22.

support metamorphosis. EBRPD will include detections of all aquatic and amphibious species in an annual monitoring report and will report detections of special-status species to the CNDDDB. EBRPD will use results of the surveys to assess the effectiveness and success of the habitat enhancement and management activities and to identify adjustments that may need to be made to long-term habitat management practices.

Adaptive Management/Contingency Measures

If surveys in BIO 24 indicate that Central California tiger salamanders were not recorded breeding in a pond in which they previously bred, or were not able to successfully metamorphose from a pond in which they bred successfully in prior years, EBRPD will investigate potential causes for this result. For example, the year of the survey may be a year of below-average rainfall, which could inhibit breeding attempts or reduce ponding drying date. In that case, no adaptive management may be necessary. If the decline appears to be limited to the populations of Central California tiger salamander utilizing the Regional Park, then EBRPD will review all pond infrastructure, and vegetation monitoring results and management measures that are specific to the ponds where successful breeding was not detected (e.g., pond drying date and water depth inspections, sediment removal, fencing/berm inspection and repair, nonnative aquatic predator monitoring and removal) and the upland habitat around those ponds (e.g., grazing practices, RDM targets, invasive plant species monitoring and removal). With the assistance of the Reviewing Agencies and species experts, EBRPD will evaluate other potential causal factors leading to declines in successful breeding and develop adaptive management and monitoring strategies to reverse any adverse conditions that may be negatively affecting populations of Central California tiger salamander in the Regional Park, and continue to implement adaptive managements until the causal factors leading to decline are resolved. Conversely, after the first 12 years of long-term management (with surveys for California red-legged frogs and California tiger salamanders occurring every 3 years), if monitoring indicates that the populations of these species in the Regional Park are stable or increasing, the frequency of surveys will be reduced to every 5 years.

1.1.7 OTHER SENSITIVE WILDLIFE SPECIES

The long-term management approach for the Central California tiger salamander and California red-legged frog described above is consistent with the maintenance of suitable habitat for other sensitive species, including the Alameda whipsnake, western pond turtle, burrowing owl, golden eagle, northern harrier, white-tailed kite, loggerhead shrike, San Francisco common yellowthroat, American badger, pallid bat, and Townsend's big-eared bat (as well as the big tarplant and round-leaved filaree, should they occur in the Regional Park). Monitoring will document the presence and relative abundance of these species in the Regional Park over time and inform management to benefit these species.

Objective: Monitor the presence of, and employ adaptive management to maintain, other sensitive species in the Regional Park

BIO 25. Record Sensitive Species Observations

Monitoring of other sensitive wildlife species (aside from the California red-legged frog and Central California tiger salamander) will occur via the compilation of observations made incidentally during monitoring and management activities by EBRPD and observations reported to EBRPD by others (e.g., the

grazing lessee or Regional Park users). EBRPD will record all such observations, including the species' location and circumstance (whether observed to be foraging, breeding, nesting, dispersing, etc.). At the end of each monitoring year, the observations will be compiled by the EBRPD, and the information will be compared to information on the abundance and distribution of each sensitive species reported in prior years. EBRPD will use the baseline data and subsequent years' observations to determine whether these species appear to be disappearing or obviously declining in areas where they were recorded during previous years. EBRPD will include observations of sensitive species and comparisons to baseline conditions in an annual monitoring report and will report all special-status species occurrences to the CNDDDB.

In the event that rare plants such as big tarplant or round-leaved filaree are detected in the Regional Park, EBRPD will record observations of these species made during other tasks, include a summary of such observations in annual reports, and report the occurrences to the CNDDDB.

Adaptive Management/Contingency Measures

If monitoring indicates sensitive species are declining or disappearing from the Regional Park, EBRPD will review the documented observations in an annual monitoring report and evaluate potential causes, such as ongoing recreational activities or management, maintenance, and monitoring tasks that may be potentially impact these species. If EBRPD determines that any activities may be the cause of the decline or disappearance, EBRPD will make appropriate adjustments to these tasks and to the AMMs to avoid or protect these sensitive species in the Regional Park.