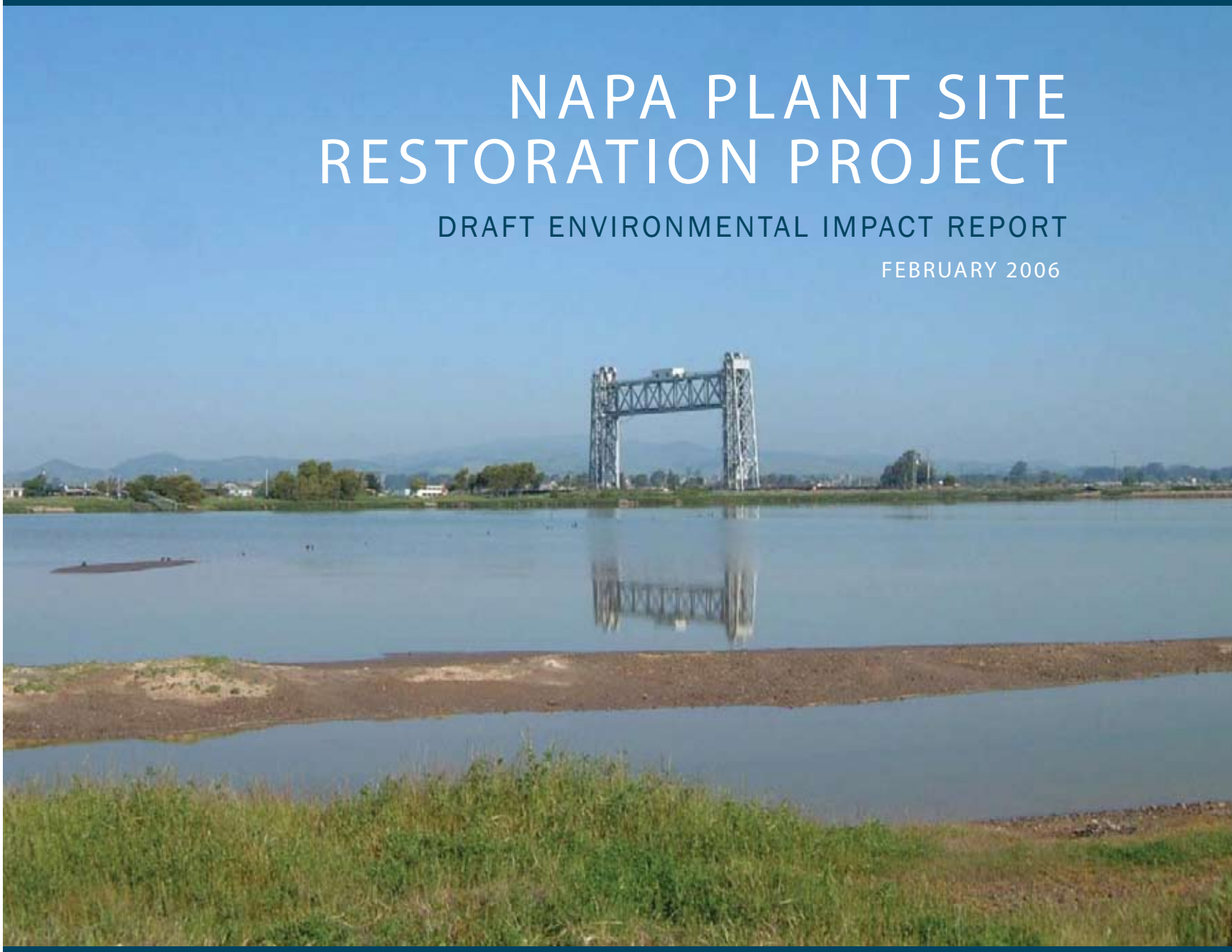
NAPA PLANT SITE RESTORATION PROJECT

DRAFT ENVIRONMENTAL IMPACT REPORT

FEBRUARY 2006



California Department of Fish and Game

Resources Legacy Fund

Draft
Napa Plant Site Restoration Project
Environmental Impact Report

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S.0 SUMMARY

S.1 INTRODUCTION

The California Department of Fish and Game (DFG) is proposing a habitat restoration project at the Napa Plant Site, a former salt production facility in the floodplain of the Napa River near the City of American Canyon, California. The 1,460-acre project site was acquired by DFG from Cargill Salt Co. (Cargill) in March 2003, as part of the larger State of California, federal, and privately sponsored purchase of 16,500 acres of salt ponds in the San Francisco Bay estuary. The Napa Plant Site Restoration (NPSR) project (proposed project) would restore a mosaic of wetland and associated habitats to benefit estuarine biota including waterfowl, shorebirds, fishes, and small mammals. It would re-establish wildlife corridors and connectivity of habitats at the landscape scale. The proposed project includes establishment of public access to the site to provide a variety of recreational and educational opportunities for the people of the region.

Historically, the area of the proposed project was predominantly tidal marsh in the floodplain of the Napa River. Around the turn of the century the proposed project area was levied for agricultural purposes. Commercial salt production at the Napa Plant Site began in the early 1950s and continued into the 1990s. Currently, Cargill is implementing a footprint reduction plan, which focuses on removing residual salt in the ponds. Due to the high salinities, ponds at the Napa Plant Site support limited wildlife use compared to other salt ponds in the region.

S.2 PURPOSE

The purposes of the proposed project are to:

- Provide habitat for a broad range of migratory shorebirds and waterfowl, marsh-dependent birds, mammals, fish and other aquatic organisms, and threatened and endangered species
- Foster connectivity among habitats on the site and with adjacent sites to enable wildlife movement,
- Create a design that can adjust to changes in the Napa River estuarine environment with minimal ongoing intervention,
- Provide wildlife-oriented public access and recreation, and
- Maintain existing levels of flood control.

S.3 PROPOSED PROJECT PLANNING GOALS AND OBJECTIVES

Regional ecological planning documents were used as a basis to develop proposed project–specific planning goals and objectives for the NPSR site. The three primary sources were the Bay-wide habitat restoration goals presented in the Goals Project (1999), the goals and objectives for the Napa-Sonoma Marsh Restoration Project (NSMRP) on the former salt ponds located across the Napa River from the proposed project site, and the goals and objectives for the South Bay Salt Ponds Project. These sources are relevant because all three projects are located in the San Francisco Bay estuary (the NSMRP is in the same reach of the Napa River as the proposed project) resulting in a shared ecological context; i.e., many of the biotic communities and abiotic

conditions are similar at the three sites. The planning goals and objectives were used to inform the development of the proposed project alternatives, guide the evaluation of the alternatives, and select the proposed project.

S.4 EXISTING CONDITIONS

Existing conditions in the area are largely a function of the contemporary land use regime. Salt ponds, levees, and water conveyance channels occupy over 90 percent of the proposed project area. Other habitats and land uses include relatively small areas of tidal marsh, seasonal wetland, and uplands with commercial and residential facilities.

S.5 PROPOSED PROJECT

The design of the proposed project considers physical, biological, and chemical conditions as they apply to ecosystem restoration, public access, infrastructure, and long-term land management. The proposed project would restore tidal action to approximately 72 percent of the site, and create an open-water area managed to provide foraging, roosting, and rafting habitat for waterfowl and shorebirds (i.e., managed pond) on approximately 12 percent of the site. The remaining area would be a mixture of seasonal wetlands, levees and uplands. Upland areas located in the north-central portion of the site would be utilized for site access, public access facilities, and DFG personnel housing.

Implementation of the proposed project would include the following major components:

- Breaching external levees and excavation of channels to provide tidal circulation
- Raising levees not formerly subject to tidal action
- Placement of fill for habitat benefits and to expedite marsh plain development
- Installation of water control structures for operation of the managed pond
- Realignment of the site access road
- Public access improvements
- Installation of a potable water line to the plant site, along Green Island Road

S.6 PROJECT ALTERNATIVES

Three alternatives to the proposed project have been identified:

- ***Alternative 1: Full tidal restoration:*** Alternative 1 would restore tidal action to all salt ponds in the proposed project area (i.e., no managed pond habitat would be created).
- ***Alternative 2: Tidal restoration, managed pond and playa:*** Alternative 2 differs from the proposed project in that a portion of the project area would function as playa habitat, i.e., the hydrology would be dependent on direct precipitation rather than tidal action. This condition would produce an environment that would mimic natural playa habitat, which can be defined as "shallow, ephemeral ponds or lagoons that experience significant seasonal changes in semiarid to arid climates … and often have high salinity or may be completely dry" (Aber 2003).

- ***Alternative 3: No Project***: In the absence of the proposed project, an environment similar to the playa habitat described in Alternative 2 would characterize the Napa Plant Site. The majority of the seasonal ponds would be devoid of vegetation because of the prolonged duration of inundation and residual salinity. Some halophytic species may be able to colonize the pond margins and areas of higher ground. Some wildlife use would likely occur. The ponds could provide suitable resting habitat for waterfowl in winter and shorebirds in the spring. Operation and maintenance of the site would be limited to emergency levee repair, and no public access facilities would be developed under this alternative.

S.7 INTENT AND SCOPE OF THE EIR

The intent of this EIR is to disclose the environmental impacts associated with this proposed restoration project. The restoration effort would have substantial habitat benefits by restoring the Napa Plant Site to a mosaic of wildlife habitats consisting of tidal marsh and a managed pond, but may result in significant geologic, land use, and public health and safety effects.

S.8 ISSUES OF KNOWN CONTROVERSY

There is much support for the proposed project from both the public and resource agencies. However, there are some areas of controversy associated with the proposed project. The primary issues of known controversy associated with the restoration of the Napa Plant Site are related to the site's proximity to Napa County Airport. The proposed project has the potential to increase the area's attraction to birds and, thus, increase the potential for aircraft bird strike hazards, which in turn could be considered an incompatible land use relative to the airport.

The proposed project has the potential to increase mosquito breeding habitat which could be a public health concern in the vicinity of the proposed project. Also, there is concern regarding how the proposed project may affect water quality in the surrounding waters and change the existing hydrology of the proposed project vicinity.

S.9 IMPACT SUMMARY

Table S-1 provides a complete listing of all impacts and mitigation measures addressed in this EIR. The table provides a summary of each impact, its significance by alternative, mitigation measures, and the impact's significance after mitigation has been applied.

Table S-1
Summary of Impacts And Mitigation Measures in the Draft EIR

Impact		Level of Significance Prior to Mitigation				Mitigation Measures	Residual Significance
4.1 Air Quality		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
AQ-1	Construction activities would directly emit both fugitive dust (PM_{10}) from ground disturbance and exhaust pollutants (NO_x, CO, PM_{10}, SO_2, and ROGx) from construction equipment.	**PS**	**PS**	**PS**	**N**	Apply the following mitigation measures to reduce fugitive dust and equipment exhaust emissions: 1. Water all active construction areas at least twice daily, if needed; 2. Cover all trucks hauling soil, sand, and other loose materials or require all such trucks to maintain at least 2 feet of freeboard; 3. Pave, apply water 3 times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites, if needed; 4. Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites, if needed; 5. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets; 6. Enclose, cover, water twice daily or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.), if needed; 7. Limit traffic speeds on unpaved roads to 15 mph; 8. Install sandbags or other erosion-control measures to prevent silt runoff to public roadways; 9. Minimize the time equipment is idling; 10. Maintain properly tuned equipment.	**L**
AQ-2	Increase emissions from vehicles and equipment from recreational users.	**L**	**L**	**L**	**N**	No mitigation required	**L**

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Impact		Level of Significance Prior to Mitigation				Mitigation Measures	Residual Significance
4.2 Biological Resources		PP	ALT 1	ALT 2	ALT 3		
BIO-1a	The proposed project could result in permanent loss of habitat or direct "take" of special-status plant species identified in local and regional plans, policies, or regulations by the DFG and USFWS. Specifically, permanent loss of habitat or direct "take" of individual species listed in Table 4.2-4 could result if the proposed project is implemented.	**PS**	**PS**	**PS**	**N**	Pre-construction surveys for special-status plant species will be conducted in areas that will be disturbed by construction activities. The pre-construction surveys will be conducted during suitable identification season(s) and within 1 year of the construction activities. If special-status plant species are observed they will be avoided if at all possible.	**L**
BIO-1b	Implementation of the proposed project could result in temporary loss of habitat provided to special-status terrestrial wildlife species identified in local and regional plans, policies, or regulations, or by the DFG and USFWS. Specifically, permanent loss, substantial reduction or direct "take" of individuals or habitat for the species listed in Table 4.2-5 including salt marsh harvest mouse, California black rail, California clapper rail, and western snowy plover could result if the proposed project is implemented.	**PS**	**PS**	**PS**	**N**	Unavoidable impacts will require incidental "take" authorization from USFWS and DFG. Proposed mitigation measures include: 1. Conducting pre-construction breeding season surveys for California clapper rail, black rail, salt marsh common yellowthroat, San Pablo song sparrow, western snowy plover, and western burrowing owl in appropriate on-site habitat that may be affected by construction (including buffer zones e.g., southern portion of Fagan Marsh); 2. Avoiding work in occupied habitat during breeding/nesting periods, as defined in Table 4.2-8 (see section 4.2); 3. Conducting construction worker "tail-gate" training, and; 4. Providing an onsite biological monitoring during construction activities in potentially occupied special status species habitat, such as salt marsh harvest mouse habitat.	**L**

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BIO-1c	Implementation of the proposed project could result in the direct "take" of special-status aquatic species identified in local and regional plans, policies, or regulations by the DFG and USFWS (Table 4.2-7). Specifically, construction of levee breaches and operation of the managed pond may result in a significant impact to native resident and migratory fish through direct "take," entrapment or adverse water quality conditions.	**PS**	**L**	**PS**	**N**	An incidental take authorization may be required from USFWS and NOAA-Fisheries for impacts to special status species for construction within the waters of the U.S., as well as operation of the managed pond (due to potential entrapment and adverse water quality). Mitigation measures to minimize the potential for entrapment and adverse water quality resulting from constructing levee breaches and managed ponds will be developed in consultation with USFWS and NOAA-Fisheries. The managed pond water control structures will be operated to minimize fish entrapment. The DFG will have two management options: (1) to close the water control structures seasonally during peak juvenile anadromous fish migration (1 December-30 April), or (2) to maintain a flow-through condition in the managed pond.	**L**
BIO-2	Implementation of the proposed project could impact up to 5 acres of sensitive natural communities.	**L**	**L**	**L**	**N**	No mitigation required	**L**
BIO-3	Implementation of the proposed project would result in impacts to state or federally protected wetlands as defined by Section 404 of the Clean Water Act including shallow subtidal waters, intertidal mudflat, and tidal marsh habitats.	**L**	**L**	**L**	**N**	No mitigation required	**L**
BIO-4	Implementation of the proposed project may interfere with anadromous fish passage by causing entrapment or increased predation.	**PS**	**L**	**PS**	**N**	Same mitigation measures as BIO-1c	**L**

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4.3 Cultural Resources		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
CR-1	This alternative would entail four levee breaches, construction of intake/outlet structures to provide for active management of one 175-acre managed pond, improvements to the perimeter levees, construction of a site access road along one of the levees connecting Green Island, and construction of water pipeline along Green Island Road Green Island and to the existing administrative building.	**L**	**L**	**L**	**N**	No mitigation required	**L**
4.4 Geological Resources		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
GEO-1	Surface rupture of a known earthquake fault may cause levee failure or structural damage.	**L**	**L**	**L**	**N**	No mitigation required	**L**
GEO-2	Existing levees are at risk from strong ground shaking from a major earthquake in the Bay Area (USGS 1999).	**L**	**L**	**L**	**N**	No feasible mitigation	**L**
GEO-3	Raising the existing eastern perimeter levees and the perimeter levee surrounding the managed pond unit may impose excess loads on the unstable substrate, potentially leading to subsidence and/or significant differential settlement.	**L**	**L**	**L**	**N**	No mitigation required	**L**
GEO-4	Expansive soils in the upland area could exhibit shrink-swell behavior that could damage proposed structures.	**L**	**L**	**L**	**N**	No mitigation required	**L**
GEO-5	Wave run-up from a tsunami may damage or overtop existing levees, resulting in levee erosion and/or failure and flooding of the neighboring properties.	**L**	**L**	**L**	**N**	No mitigation required	**L**

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GEO-6	Exposure of native and engineered soils during construction activities could make them prone to erosion due to periods of increased slope runoff during winter rainstorms (even on gentle and moderate slopes).	**L**	**L**	**L**	**N**	No mitigation required	**L**
GEO-7	The presence of shallow groundwater could adversely affect excavation/construction activities.	**L**	**L**	**L**	**N**	No mitigation required	**L**
4.5 Hazardous Materials		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
HAZ-1	The proposed project would result in the transport of hazardous materials to and from the proposed project site during construction activities that would not pose a significant hazard to the public.	**L**	**L**	**L**	**N**	No mitigation required	**L**
HAZ-2	Construction activities for the proposed project could result in potential exposure to and/or release of hazardous materials/waste.	**L**	**L**	**L**	**N**	No mitigation required	**L**
HAZ-3	Excavation of soils for construction of the new water pipeline and tidal channels could cause health hazards to construction workers and the public should contamination be encountered.	**L**	**L**	**L**	**N**	No mitigation required	**L**
HAZ-4	Construction activities could result in the release of irritant dust.	**PS**	**PS**	**PS**	**N**	The contractor will achieve compliance with the nuisance dust standard by implementing Mitigation Measure AQ-1. As described in Section 4.1, Air Quality, the contractor will be required to comply with most of BAAQMD's BMPs for dust control.	**L**

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4.6 Hydrology & Water Resources		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
WR/HYD-1	The proposed project would substantially alter the existing flow patterns on the site in a manner that would result in substantial erosion or siltation on-site or off-site.	**L**	**L**	**L**	**N**	No mitigation required	**L**
WR/HYD-2	The proposed project could expose people or structures to a significant risk of loss, injury, or death involving flooding.	**PS**	**PS**	**PS**	**N**	Close visitor center when Napa River is predicted to be at flood stage. Post escape routes to high ground on Green Island in Visitor Center.	**L**
4.7 Water & Sediment Quality		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
WA-SED-1	Implementation of the proposed project could result in discharge of contaminated stormwater during construction.	**L**	**L**	**L**	**N**	No mitigation required	**L**
WA-SED-2	Implementation of the proposed project could result in an increase in salinity in the Napa River or in Fagan Slough.	**PS**	**L**	**PS**	**N**	Impacts to the Napa River will be minimized by constructing the proposed project while the ponds are dry and by controlling the timing, rate, and concentration of discharges from the managed pond. The proposed project would avoid discharging water from the managed pond to the Napa River in an abrupt manner, during low flow in the Napa River and when managed pond salinity is greater than 100 ppt. Discharge from the managed pond will be minimized during salmonid migration in the river from December 1 through April 30.	**L**
WA-SED-3	Implementation of the proposed project could result in an increase/decrease of other general water quality parameters in the Napa River or Fagan Slough.	**PS**	**L**	**PS**	**N**	Compliance with Waste Discharge Requirements or an NPDES permit requirements that may be issued for managed pond operation	**L**
WA-SED-4	Implementation of the proposed project could result in an increase in priority pollutants in the waters of Napa River or Fagan Slough.	**L**	**L**	**L**	**N**	No mitigation required	**L**

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WA-SED-5	Implementation of the proposed project could result in increases in the amount of mercury in the water in the Napa Plant site ponds.	**PS**	**PS**	**PS**	**N**	Monitor mercury concentrations pre-implementation and post- implementation (annually for 5 years) of the proposed project to determine if the restoration of tidal exchange leads to an increase in mercury concentration in the ponds.	**L**
WA-SED-6	Implementation of the proposed project could result in accumulation of methyl mercury in the sediment of the pond bottoms.	**PS**	**PS**	**PS**	**N**	Monitor mercury concentrations prior to and after implementation (annually for 5 years) of the proposed project to determine if the restoration of tidal exchange leads to increased sediment methyl mercury concentrations.	**L**
4.8 Land Use, Planning and Community Issues		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
LU-1	The proposed project would not directly or indirectly convert any lands on or adjacent to the site identified as Important Farmland under the FMMP to nonagricultural uses. However, the proposed project could indirectly affect adjacent agricultural lands.	**L**	**L**	**L**	**N**	No mitigation required	**L**
LU-2	Implementation of the proposed project would conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project that was adopted for the purpose of avoiding or mitigating an environmental effect.	**S**	**S**	**S**	**PS**	No mitigation other than PHS-1a and 1b.	**S**
4.9 Noise		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
N-1	Construction activities for the proposed project would generate noise levels above 75 dBA at nearby residential sites located on Green Island Road.	**L**	**L**	**L**	**N**	No mitigation required	**L**

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4.10 Public Services & Utilities		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
PSU-1	The proposed project would require construction of a water supply pipeline extension to the proposed project site.	**L**	**L**	**L**	**N**	No mitigation required	**L**
PSU-2	The proposed project may increase the need for the County's Mosquito Abatement services.	**PS**	**PS**	**PS**	**N**	The proposed project sponsors will coordinate with NCMAD during the design, implementation, and operations phases of the proposed project. DFG will consult with NCMAD during the project design phase to incorporate design elements to reduce the mosquito production potential of the proposed project	**L**
4.11 Public Health and Safety		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
PHS-1	The proposed project would be located in an airport land use planning area and could result in a safety hazard for operations of aircraft using the airport.	**S**	**S**	**S**	**PS**	PHS-1a Excavate tidal channels into the site to enhance draining, reduce areas of standing water, and thereby reduce waterfowl use of the site PHS-1b Increase the surface elevation of the ponds underneath the basic flight pattern of Runways 6/24 and 18R/36L to hasten vegetation establishment, reducing the use of the site by flocking shorebirds and waterfowl	**S**
PHS-2	The proposed project has the potential to increase habitat for disease vectors.	**PS**	**PS**	**PS**	**N**	See Mitigation Measures PHS-1 and PSU-2 above	**L**
4.12 Public Access, Recreation & Visual		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
PARV-1	The proposed project includes the construction of recreation facilities, which might have an adverse physical effect on the environment.	**PS**	**PS**	**PS**	**N**	Mitigation Measures BIO-1a through BIO-4	**L**

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PARV-2	The proposed project would introduce a new source of substantial light that could affect nighttime views in the area.	**L**	**L**	**L**	**N**	No mitigation required	**L**
4.13 Transportation		**PP**	**ALT 1**	**ALT 2**	**ALT 3**		
TR-1	Construction and operation of the proposed project would increase the number of vehicle trips at the proposed project site.	**L**	**L**	**L**	**N**	No mitigation required	**L**
TR-2	Construction and operation of the proposed project would increase the number of watercraft trips in the proposed project area.	**L**	**L**	**L**	**N**	No mitigation required	**L**
TR-3	Implementation of the proposed project would require additional parking.	**L**	**L**	**L**	**N**	No mitigation required	**L**

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Acronyms and Abbreviations

µg/m3	microgram(s) per cubic meter

ADAM	Aerometric Data Analysis and Management System
ALUCP	Airport Land Use Compatibility Plan
APE	area of potential effects
BAAQMD	Bay Area Air Quality Management District
Basin Plan	San Francisco Bay Region Water Quality Control Plan
BCDC	San Francisco Bay Conservation and Development Commission
bgs	below ground surface
BMP	Best Management Practices
BP	before present
Caltrans	California Department of Transportation
CARB	California Air Resources Board
Cargill	Cargill Salt Co.
CB	Crystallizer Beds
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
cfs	cubic feet per second
cm/s	centimeter(s) per second
CNDDB	California Natural Diversity Database
CO	carbon monoxide
CRAM	California Rapid Assessment Method
CRHR	California Register of Historic Resources
dB	decibel(s)
dBA	A-weighted decibel(s)
DDE	dichlorodiphenyldichloroethelene
DDT	dichlorodiphenyltrichloroethane
DFG	California Department of Fish and Game
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESU	Evolutionary Significance Unit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program

FR	Federal Register
GIS	Geographic Information System
GPS	Global Positioning System
HCP	Habitat Conservation Plan
IRWM	Integrated Regional Wetland Monitoring
JRP	JRP Historical Consulting Services
km	kilometer(s)
Ldn	day-night equivalent sound level
Leq	equivalent sound level
LIDAR	Light Detection and Ranging
mg/kg	milligram(s) per kilogram
mg/l	milligram(s) per liter
MHHW	mean higher high water
MHW	mean high water
mi^2	square mile(s)
MLLW	mean lower low water
MLW	mean low water
MSL	mean sea level
N	nitrogen
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum
NCCP	Natural Community Conservation Plan
NCMAD	Napa County Mosquito Abatement District
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPSR	Napa Plant Site Restoration
NRFMP	Napa River Fisheries Monitoring Program
NSMRP	Napa-Sonoma Marsh Restoration Project
NSMWA	Napa-Sonoma Marshes Wildlife Area
O_3	ozone

P	phosphorous
PAH	polynuclear aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
PG&E	Pacific Gas and Electric Company
pg/l	picograms per liter
PM_{10}	respirable particulate matter
$PM_{2.5}$	fine particulate matter
ppm	part(s) per million
ppt	part(s) per thousand
PRC	Public Resources Code
PRG	Preliminary Remediation Goal
proposed project	NPSR project
RBSL	Risk-Based Screening Level
RMP	Restoration Monitoring Plan in Section 2 and Regional Monitoring Program in Section 4.7
ROG	reactive organic compound
RPZ	runway protection zone
RSA	runway safety area
RWQCB	California Regional Water Quality Control Board, San Francisco Bay Region
SFBAAB	San Francisco Bay Area Air Basin
SMART	Sonoma-Marin Area Rail Transit
SO_2	sulfur dioxide
SR	State Route
SVOCs	semivolatile organic compounds
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gas
TPH-mo	total petroleum hydrocarbons as motor oil
USACE	U.S. Army Corps of Engineers

USCS	United States Coastal Survey
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOCs	volatile organic compounds

1.0 INTRODUCTION

This chapter provides an introduction to the Napa Plant Site Restoration (NPSR) project (proposed project) including project background, need for the proposed project, project planning goals and objectives, and report organization.

1.1 PROJECT BACKGROUND

The California Department of Fish and Game (DFG) is proposing a habitat restoration project at the Napa Plant Site, a former salt production facility in the floodplain of the Napa River near the City of American Canyon, California (Figure 1-1). The 1,460-acre project site was acquired by DFG from Cargill Salt Co. (Cargill) in March 2003, as part of the larger State of California, federal, and privately sponsored purchase of 16,500 acres of salt ponds in the San Francisco Bay estuary. The proposed project would restore a mosaic of wetland and associated habitats to benefit estuarine biota including waterfowl, shorebirds, fishes, and small mammals. It would re-establish wildlife corridors and connectivity of habitats at the landscape scale. The proposed project includes establishment of public access to the site to provide a variety of recreational and educational opportunities for the people of the region.

Historically, the project area was predominantly tidal marsh in the floodplain of the Napa River. An 1856 United States Coastal Survey (USCS) topographic map depicts a landscape dominated by tidal marsh with complex drainage networks (Figure 1-2). Around the turn of the century a levee was constructed to isolate the project area and facilitate agriculture (see Chapter 4, Section 3, "Cultural Resources"). Commercial salt production at the Napa Plant Site began in the early 1950s and continued into the 1990s. The site encompasses various types of salt ponds (i.e., pickle ponds, crystallizer beds and wash ponds) as well as salt harvesting, processing and shipping facilities. Figure 1-3 depicts the salt production operations at the Napa Plant Site. The salt production process began in over 7,000 acres of evaporation ponds located across the Napa River from the Napa Plant Site. The ponds located at the Napa Plant Site contained the highest salt concentrations because they were used in the final stages of salt production and harvesting. Due to the high salinities, ponds at the Napa Plant Site support limited wildlife use compared to other salt ponds in the region. Currently, Cargill is implementing a footprint reduction plan, which focuses on removing residual salt in the ponds.

1.2 NEED FOR THE PROPOSED PROJECT

The purposes of the proposed project are to:

- Provide habitat for a broad range of migratory shorebirds and waterfowl, marsh-dependent birds, mammals, fish and other aquatic organisms, threatened and endangered species
- Foster connectivity among habitats on the site and with adjacent sites to enable wildlife movement,
- Create a design that can adjust to changes in the Napa River estuarine environment with minimal ongoing intervention,
- Provide wildlife-oriented public access and recreation, and
- Maintain existing levels of flood control.

The following points explain the need for the proposed project:

- Historic wetland losses in San Francisco Bay and particularly in the Napa River Estuary
- Need to restore habitat for the recovery of federally and state-listed species
- Limited habitat value of the Napa Plant Site salt ponds in their existing condition
- Lack of recreational public access and educational opportunities in this reach of the Napa River
- Increased potential for bird strikes at the Napa County Airport in the absence of the proposed project

Each of these items is discussed further in the following sections.

1.2.1 Historic Losses of Marsh Ecosystems and Habitats

Prior to large-scale European settlement of the San Francisco Bay area beginning in 1850 and the subsequent modification of the estuary, a 2- to 3-mile band of tidal marsh bordered much of the South Bay and bands of tidal marsh 4 or 5 miles wide bordered the north shores of San Pablo and Suisun bays. By 1950 approximately 79 to 85 percent of the historic marshlands had been diked or filled for conversion to agricultural land, salt evaporation ponds, and various other human endeavors (Atwater et al. 1979; Nichols et al. 1986; Goals Project 1999). Concurrent with the destruction of the historic marshlands, anthropogenic activity increased the sediment load[1] to the Bay and created new marshland, exemplified by the accreting end of the north shore of San Pablo Bay. A large fraction of present marshlands originated since 1850 (Dedrick 1989). Today, pristine remnants of historical tidal marshlands are especially rare, as few as 8 percent of the original are extant (Goals Project 1999). Those few that remain are along the inner reaches of some of San Pablo Bay's larger tributaries i.e., the Petaluma and Napa rivers.

The historic marshlands of the North Bay have unique characteristics that distinguish them from older marsh fragments in other subregions of the Bay; they are higher in elevation (above mean higher high water [MHHW]), have more emergent marsh vegetation, have a lower rate of subsidence relative to mean tidal level, receive a higher inflow of fresh water, and are larger than the marshes of the southern reaches of San Francisco Bay (Atwater et al. 1979; Conomos 1979; Josselyn 1983; Cuneo 1987; Moffatt et al. 1987; Dedrick 1989). Some tidal-marsh dependent species are now largely confined to the most pristine remnants of historical tidal marshlands in the North Bay; the state-threatened California black rail (*Laterallus jamaicensis cortuniculus*) is an example (Evens et al. 1991).

Proximity of historic tidal marshes to restoration sites adds value to the latter, as a source of seed populations of plants and animals. The marshes associated with Fagan Slough and Coon Island, both adjacent to the proposed project, are functional examples of such historic marshlands. If and when the emergent tidal marsh envisioned for the proposed project is fully developed, it will augment existing habitat values at these nearby marshes that support viable populations of several listed species. For example, the proposed project would reconnect the historical southern section of Fagan Marsh with the undisturbed northern section.

[1] The largest contribution of sediment was from hydraulic mining operations that commenced in 1849 in the Sierra Nevada Mountains, washing sediment into streams and rivers and ultimately to San Francisco Bay.

1.2.2 Recovery of Federally and State-Listed Species[2]

The proximity of relatively pristine, historic marshes to the proposed project increases the likelihood that dispersants[3] will occupy restored habitat and colonize the site. Both Fagan Slough and Coon Island marshes support viable populations of several tidal marsh-dependent taxa–San Francisco common yellowthroat (*Geothlypis trichas sinuosa*), California black rail, and San Pablo song sparrow (*Melospiza melodia samuelis*)–all of which are special-status species (CDFG 2005). Indeed, the marsh complex comprised of Bull Island, Fagan Slough, and Coon Island supports the some of the highest densities of these species in the North Bay. Additionally, Coon Island is the apparent population center of the federally endangered California clapper rail (*Rallus longirostris obsoletus*) in the Napa River system, and the importance of that subpopulation has increased with the decrease in abundance of clapper rails in the White Slough marshes (downstream) in recent years (Avocet Research Associates 2004, 2005).

It should be noted here that conversion of the site from salt ponds to a habitat complex dominated by tidal marshland would not displace or reduce available habitat of other threatened or endangered species. As alluded to in the Goals Project (1999), "Restoring tidal marsh at a salt pond to benefit California clapper rail and the salt marsh harvest mouse (*Reithrodontomys raviventris*) could reduce habitat for the least tern (*Sterna antillarum*) or (western) snowy plover *(Charadrius alexandrinus nivosus)*" (p. 160). Neither the tern nor plover are known to breed at the site or in the vicinity.

Other listed species (CDFG 2005; PRBO 2003) known to occur in adjacent habitats include soft bird's beak (*Cordylanthus mollis* spp. *mollis*), Mason's lilaeosis (*Lilaeopsis masonii),* salt marsh harvest mouse, North American river otter (*Lutra Canadensis*), double-crested cormorant (*Phalacrocorax auritus*), great egret (*Ardea alba*), great blue heron (*Area herodias*), snowy egret (*Egretta thula*), American bittern (*Botaurus lentiginosus*), black-crowned night heron (*Nycticorax nycticorax*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), and burrowing owl (*Athene cunicularia*).

1.2.3 Limited Ecological Value of the Ponds in the Existing Condition

The proposed project site consists mostly of salt ponds with very limited ecological value due to high salt concentrations (approximate range 80-280 parts per thousand [ppt]). Another factor limiting the site's habitat value is that the ponds are dry during some months of the year. The vascular plant community associated with the salt pond habitat is confined to pond margins, islets, and internal levees within the pond complex. The most common plants observed on these terrestrial features are non-native iceplant (*Carpobrotus* sp.) and slender-leaved iceplant (*Mesenbranthemum nodiflorum*). The high salinity concentrations in the ponds limit the habitat value for most terrestrial and aquatic organisms. Overall, bird diversity and abundance in the salt ponds is low because the high salinity ponds lack significant prey resources. In contrast, low salinity evaporator ponds on the west side of the Napa River have high species abundance and diversity. For example, in February 2005 over 30,000 birds representing 31 species

[2] In this document the terms "listed species" and "special-status species" are used synonymously. Both terms refer to flora and fauna that have been identified as rare, threatened or endangered by state (DFG) and federal (USFWS) regulatory agencies or nongovernmental entities (e.g., California Native Plant Society).
[3] Dispersants are individuals that move from an occupied habitat to a new habitat.

(predominately shorebirds and waterfowl) were recorded in Pond 4 (960 acres), while only 400 birds (all gulls) were observed in the salt ponds of the Napa Plant Site combined (USGS 2005).

1.2.4 Lack of Recreational Public Access and Educational Opportunities in this Reach of the Napa River

The vicinity of the proposed project lacks public access facilities. This segment of the Napa River and adjacent lands do not provide public facilities for boat launching, trails for hiking or bicycling, or picnic grounds. The nearest public boat launch ramps on the east side of the Napa River are located 7.3 miles south (downstream) at the Vallejo Marina and 4.7 miles north (upstream) at Kennedy Park in Napa. The closest launch ramp on the west side of the river is at Cuttings Wharf, located 1.3 miles upstream. The proposed project area is also a missing link in the San Francisco Bay Trail system. The end of Green Island Road is used for public access for fishing from the levee, but is unimproved. The closest hiking or bicycling opportunities near the river or its wetlands include Wetland's Edge Drive in the City of American Canyon to the south and Kennedy Park in Napa to the north. No environmental education centers are located in the lower Napa River watershed, or in surrounding communities.

1.2.5 Increased Potential for Bird Strikes at the Napa County Airport in the Absence of the proposed project

Current salt pond operation results in active management of the water in the ponds. Specifically, the ponds are filled in the fall, the pickle ponds (see Section 1.2.3) are drained in July or August, and the crystallizer beds are drained in late fall. After Cargill ceases active pond management, water will accumulate in all the ponds as a result of the winter rains and remain in the ponds until it evaporates in the summer. The ponds may hold water for up to 8 months a year. However, the residual salt concentrations will greatly limit, if not prevent, vegetation growth in the ponds. Standing water provides potential roosting habitat for birds, including multiple species of water birds (shorebirds, waterfowl, wading birds, geese, etc.). Studies on salt ponds in the South Bay have shown that open-water salt ponds support higher densities of birds when compared with vegetated marsh (Stralberg et al. 2003). Conversely, if the proposed project is implemented, introducing twice daily tidal action to the entire site (except the managed pond[4]) ensures vegetation will become established over time (see Section 2.2.1.1). The dense wetland vegetation provides habitat for small, nonflocking birds such as song sparrows, marsh wrens, and common yellowthroat.

1.3 PROJECT PLANNING GOALS AND OBJECTIVES

Regional ecological planning documents were used as a basis to develop project-specific planning goals and objectives for the NPSR site. The three primary sources were the Baywide habitat restoration goals presented in the Goals Report (1999), the goals and objectives for the Napa-Sonoma Marsh Restoration Project (NSMRP) on the former salt ponds located across the Napa River from the proposed project site (U.S. Army Corps of Engineers 2004), and the goals and objectives for the South Bay Salt Ponds Project (PWA et al. 2004). These sources are

[4] For the purposes of this document a managed pond is defined as an open-water area managed to provide foraging, roosting, and rafting habitat for waterfowl and shorebirds.

relevant because all three projects are located in the San Francisco Bay estuary (the NSMRP is in the same reach of the Napa River as the proposed project) resulting in a shared ecological context; i.e., many of the biotic communities and abiotic conditions are similar at the three sites.

The planning goals and objectives were used to inform the development of proposed project alternatives, guide the evaluation of alternatives, and select the proposed project.

Goal 1.	***Create conditions that will lead to the establishment of a full range of tidal habitats***
Objective 1.A	Create tidal marsh
Objective 1.B	Make use of historic slough channels/locations
Objective 1.C	Create a tidal channel network template in the marsh plain to achieve full range of channel cross-section dimensions
Objective 1.D	Create large tidal drainage basins that will sustain subtidal channel habitat
Objective 1.E	Create habitat for aquatic and terrestrial native species including migratory birds, fish mammals, plants, invertebrates, and special-status species
Objective 1.F	Create intertidal mudflat and shallow subtidal habitat
Objective 1.G	Enhance and expand existing ecotones (transitions to upland habitat) and create new ecotone
Objective 1.H	Create conditions for the establishment of mature tidal marsh
Objective 1.I	Maximize synergy with existing habitat (e.g., Fagan Marsh)
Objective 1.J	Minimize potential for bird strikes
Objective 1.K	Minimize erosion of existing marshes and unintended levee breaching that may result from increases in tidal prism from successive opening of restoration projects throughout the area
Objective 1.L	Minimize loss of mudflat from breaching levees in Crystallizer Bed 8 and Pond B-3
Goal 2.	***Identify areas to be operated as managed ponds***
Objective 2.A	Create conditions that will provide habitat for migratory birds (shorebirds/waterfowl)
Objective 2.B	Create structural complexity for water-related birds
Objective 2.C	Select areas that facilitate maintenance access
Objective 2.D	Minimize potential adverse water quality conditions: pH, dissolved oxygen, temperature, salinity

Goal 3.	***Maintain levels of flood protection provided by existing levees on proposed project site***
Objective 3.A	Study and adopt design that will minimize need for new flood protection levees
Objective 3.B	If new levees are required to protect adjacent properties, design to maintain existing level of flood protection
Objective 3.C	Maintain existing flood protection/drainage in the Napa County Airport area
Objective 3.D	Seek opportunities for collaboration with local agencies
Goal 4.	***Implement design and management measures to maintain current levels of vector management***
Objective 4.A	Work with Napa County Mosquito Abatement District (NCMAD) during design development
Objective 4.B	Provide access for vector management
Objective 4.C	Avoid hydrologically isolated depressions with emergent vegetation
Goal 5.	***Promote environmental benefit and reduce impacts***
Objective 5.A	Identify and preserve cultural resources in the proposed project area, including important archaeological and historical sites
Objective 5.B	Coordinate with Native Americans, if significant cultural resources are identified
Objective 5.C	Design restoration to rely on natural processes and topographic features to minimize construction activities
Objective 5.D	Promote compatibility with surrounding land uses
Objective 5.E	Promote consistency with regional planning initiatives
Objective 5.F	Provide safe, convenient access to the proposed project area
Objective 5.G	Protect existing or provide alternate maintenance access for existing infrastructure, including the railroad tracks
Objective 5.H	Identify appropriate areas for DFG and partner agency facilities
Goal 6.	***Provide wildlife compatible recreational opportunities consistent with DFG policies and regulations***
Objective 6.A	Coordinate pedestrian and bicycle trail development with the Bay Trail, Napa County, and City of American Canyon, as appropriate
Objective 6.B	Create access facilities in close proximity to existing access points, such as Green Island Road

Objective 6.C	Provide opportunities for hand-launched watercraft, e.g., kayaks and canoes
Objective 6.D	Create an interpretive panel(s) for public outreach and education
Objective 6.E	Create angling access points
Objective 6.F	Minimize conflicts with railroad
Objective 6.G	Design trail surfaces for specific uses, e.g., hiking, bird watching, biking
Objective 6.H	Identify areas for a possible future interpretive/educational facilities
Objective 6.I	Identify opportunities for partnerships with other groups for educational and interpretive activities

Goal 7. ***Minimize ecological risks from restoration***

Objective 7.A	Phase proposed project to restore tidal circulation as Cargill completes harvest operations and consistent with regulatory requirements
Objective 7.B	Minimize mobilization of contaminants that may be present in sediments, to the extent feasible

Goal 8. ***Design restoration implementation, management, and monitoring that can be effectively executed with minimal cost. Phase construction to meet funding availability***

Objective 8.A	Adopt design that will be self-sustaining and minimize operations and maintenance as much as possible
Objective 8.B	Manage construction costs to achieve goals and objectives of the proposed project with available funding
Objective 8.C	Limit costs associated with delay
Objective 8.D	Form partnerships and alliances to develop and institute a long-term viable funding strategy
Objective 8.E	Integrate site-specific monitoring efforts with regional monitoring programs (e.g., California Rapid Assessment Method [CRAM], Integrated Regional Wetland Monitoring [IRWM]).
Objective 8.F	Design habitat restoration to minimize terrestrial predator access
Objective 8.G	Design habitat to minimize potential for colonization by invasive species
Objective 8.H	Design public access to minimize maintenance and policing
Objective 8.I	Define monitoring to support evaluation of proposed project goals and objectives

1.4 REPORT ORGANIZATION

This Environmental Impact Report (EIR) is organized into the following chapters:

- **Summary**, identifies each significant environmental effect, proposed mitigation measures, areas of known controversy, and unresolved issues.
- **Chapter 1, Introduction,** provides an introduction and overview describing the project background, the need for the proposed project, project planning goals and objectives, and report organization.
- **Chapter 2, Project Description,** provides a detailed description of the proposed project, including its location, background information, major objectives, and technical characteristics.
- **Chapter 3, Overview of CEQA Compliance,** provides a description of California Environmental Quality Act (CEQA) compliance, intent and scope of the EIR, Public involvement and scooping, and consultation and other requirements.
- **Chapter 4, Environmental Setting, Impacts, and Mitigation,** contains the proposed project and alternatives impact analysis of environmental-issue areas. The subsection for each environmental issue contains an introduction and description of the existing setting, standards of significance, methodology used to evaluate impacts, and project- and alternative-specific impacts and appropriate mitigation measures.
- **Chapter 5, Other CEQA Considerations,** provides discussions required by CEQA regarding impacts that would result from the proposed project including significant and unavoidable environmental impacts, significant and irreversible environmental effects, growth-inducing impacts and a summary of cumulative impacts.
- **Chapter 6, List of Preparers and Contributors,** identifies the persons who prepared the EIR and those who were consulted during its preparation.
- **Chapter 7, References,** identifies the references used in the EIR preparation.

2.0 PROJECT DESCRIPTION

This chapter summarizes existing conditions in the project area, and describes the proposed project and project alternatives. More detailed descriptions of existing conditions are provided in the project setting sections of Chapter 4 in this document.

2.1 SITE DESCRIPTION

2.1.1 Location

The project area is situated in the floodplain of the Napa River approximately 5 miles north of the confluence with San Pablo Bay. The area surrounding the project site includes open space, light industrial and commercial activities, an airport, agriculture, and residential homes (Figure 1-1). South and west of the site is the Napa River, which is used for commerce and recreation, marsh and wetlands. A closed municipal landfill is located south of the site. East of the site is a mixture of wetlands; agricultural activities, including the Green Island Vineyard, an apiary, and grazing; open space; residential homes; Napa County Airport; Napa County Airport Industrial Park; City of American Canyon wastewater treatment facilities; and industrial wrecking yards. To the north of the site is Fagan Marsh Ecological Reserve, a large wetland area owned by DFG. The Cuttings Wharf Marina, located northwest of the project site, contains a park and allows public access to the west side of the Napa River. The Milton Road residential community is located on the western bank of the river.

The proposed project is part of the historic Napa-Sonoma Marsh that originally covered approximately 40,000 acres north of San Pablo Bay. Approximately 16,000 -17,000 acres of the historic wetland area is owned by DFG and is designated the Napa-Sonoma Marshes Wildlife Area (NSMWA). The proposed project area will comprise two of the many units of the NSMWA (see Section 2.2.1 for details).

2.1.2 Existing Conditions

Existing conditions in the project area are largely a function of the contemporary land use regime. Salt ponds, levees, and water conveyance channels occupy over 90 percent of the project area (Figure 2-1, Table 2-1). Other habitats and land uses include relatively small areas of tidal marsh, seasonal wetland, and uplands with commercial and residential facilities. Figure 2-2 shows some representative photographs of the project site.

Table 2-1
Existing Land Cover in the Project Area

Land Cover	Acres	Percent
Salt ponds	1,142	78
Levees	151	10
Water Conveyance Channels	64	4
Uplands (including commercial salt facilities, landscaped areas and housing)	42	3
Seasonal Wetlands	35	2
Tidal Channel	13	< 1
Tidal Marsh	12	< 1
Intertidal Mudflat	1	< 1
Total	**1,460**	**100**

2.1.2.1 Salt Ponds

Salt ponds in the project area were historically tidal marsh and marsh ecotone. The alignments of historic slough channels were mapped in an 1856 survey and can be seen in contemporary aerial photos of the site (Figure 1-2). In the past, water movement among salt ponds was managed to maximize salt production. Currently, the management objective is to reduce residual salinity. Details of the salt production and salinity reduction operations are presented below.

Salt Production Operations (1952–early 1990s)

Figure 1-3 depicts Cargill's operation of the Napa Plant for salt production. The process involved pumping brine (saline water) from Pond 7a located on the west side of the Napa River under the riverbed to the east side. Pump Number 2 on the east side of the Napa River was used to distribute water via brine ditches (water conveyance channels) to the pickle ponds. Ponds B-1, B-2, B-3, and Unit 3 were the primary pickle ponds. Ponds 9 and 10 were used as batch pickle ponds when brine concentrations in Ponds B-1, B-2, B-3, and Unit 3 were high (so as to not reduce the salt concentration). To move water to and from Ponds 9 and 10 required pumping brine via Pump Number 3. Pickle ponds had brine with salinity concentrations ranging from 140 to 312 ppt (Siegel and Bachand 2001).

Highly concentrated brine solution (approximately 300 ppt) was delivered by gravity feed from the pickle ponds to Crystallizer Beds (CBs) 1 through 9 in series. Crystallizer beds were managed in an optimal salinity range (356 to 369 ppt) to promote precipitation of sodium chloride. A layer of salt between 5.5 to 6 inches thick precipitated onto the crystallizer bed. The salt layer was exposed after the residual brine, often referred to as bittern, was pumped back to the west side of the river and held in storage ponds. Salt was typically harvested in August through December. The harvested salt was then washed (using brine to avoid "melting" or dissolution of the salt) to remove sediments and other impurities. Brine used to wash the salt was discharged to the wash ponds (Ponds W1, W2, and W3) where the sediment would settle out of solution. The remaining water was returned to the pickle ponds. After harvest, the crystallizer beds were prepared for the next salt crop. In the spring, the crystallizer beds were rinsed with river water, then leveled and smoothed prior to adding a new batch of brine. Standard salt production operations at the Napa Plant ceased in the early 1990s.

Phase-Out Operations (2003–present)

Salinity reduction operations began in 2003. Current phase-out operations are focused on reducing the aerial extent (footprint) of the plant operations by sequentially decreasing the residual salts remaining in the ponds. This is being accomplished by allowing the pickle ponds to flood during the winter so salt in the pond bottoms can dissolve into solution. This brine solution is then moved to the crystallizer beds for evaporation and harvest. The process yields some commercial salt product. Salt generated at the site is stockpiled, then shipped from the site via barges on the Napa River.

The tidal inlet south of Pond W1 is used for loading salt onto barges. This channel is referred to as the "barge channel" in this document. The southern portion of Pond W1 is used as a dredge material handling site (Figure 2-1). Cargill has placed sediment dredged from the barge channel in this area. After drying, the dredged material has been used for levee maintenance or other purposes.[1]

Ponds 9 and 10 were the initial focus of the salinity reduction effort. In the first year only direct precipitation entered the ponds. In years 2 and 3 river water was used in addition to rainwater to flush the ponds. Currently, river water is taken into the system only when necessary; instead the ponds are fed via direct precipitation. Salinity in Ponds 9 and 10 has been reduced and Cargill plans to have these ponds available for restoration by 2007. Salt reduction activities in the remaining pickle ponds and crystallizer beds are expected to continue over the next 5 to 7 years (2010 to 2012). The wash ponds (W1, W2, W3) may be ready for restoration in conjunction with Ponds 9 and 10 or Cargill may require their use until all salt reduction activities are completed.

2.1.2.2 Wetlands

The project area has approximately 48 acres other types of wetlands[2] in addition to the salt ponds (Table 2-1). Seasonal wetlands occur within the project area along the railroad corridor where adjacent swales and drainage ditches were created to aid in controlling storm water runoff; in the drainage channel east of Ponds B-1, B-2 and B-3; and in former tidal wetlands (i.e., diked marsh) that have not been drastically disturbed by salt-making activities (Figure 2-1). Two vegetation communities comprise the majority of the seasonal wetland habitat: a pickleweed dominated community and an ecotone community.

The distribution of tidal marsh on the project site is limited to the margins of the barge channel, and the outboard side of riverfront levees (Figure 2-1). A large mudflat (approximately 190 acres) exists immediately south and west of the project area in the intertidal zone between the salt pond levees and the subtidal channel of the Napa River (Figure 2-1).

[1] The proposed project may also use material dredged from the barge channel for levee improvements or to construct habitat features.

[2] A wetland delineation to determine the jurisdiction of the U.S. Army Corps of Engineers will be conducted in conjunction with obtaining permits for construction.

2.1.2.3 Levee

The project area levees extend for miles and cover an area of over 150 acres. The largest levees form the perimeter of the project area. Smaller "internal levees" form the boundaries of the salt ponds and water conveyance channels. The levees are constructed primarily from native Bay Mud material. However, portions of the perimeter levee are armored with concrete and other structural debris. The vegetation type on the levees varies with elevation. The highest and driest portions of the perimeter levee are dominated by non-native, ruderal species such as wild radish (*Raphanus sativus*). Lower, mesic portions of the levees are dominated by nonnative, iceplant species (*Carpobrotus* sp. and *Mesenbranthemum nodiflorum*).

2.1.2.4 Uplands

Uplands in the project area include the salt production facilities, Green Island, and other areas of disturbed ground and fill. These areas comprise approximately 42 acres of the project site. Upland vegetation includes ornamental landscaping on Green Island, and ruderal, nonnative species in disturbed areas. One residential structure is present on Green Island, and three plant operation buildings are located south of the barge channel.

2.2 PROPOSED PROJECT

2.2.1 Overview

The design of the proposed project considers physical, biological, and chemical conditions as they apply to ecosystem restoration, public access, infrastructure, and long-term land management. For the purposes of restoration planning the site has been divided into three units based on hydrologic connectivity and geography (Figure 2-3):

- **North Unit** (205 acres): This unit includes Ponds 9 and 10, which are located between the Northwest Pacific Railroad and Fagan Marsh Ecological Reserve. The North Unit will be part of the Fagan Marsh Ecological Reserve.
- **Central Unit** (175 acres): This unit includes Wash Ponds W1, W2, and W3. The Central Unit also includes Green Island, salt production facilities, the barge channel, and the site's access road.
- **South Unit** (1080 acres): This unit includes CB1 through CB9 and Ponds B-1, B-2, B-3, and Unit 3. The Central and South Units of the proposed project will comprise the Green Island Unit of the NSMWA.

Figure 2-4 depicts the major components of the proposed project. All of the salt ponds in the project area would be restored to tidal action except CB1 through CB3. The historic topographic survey (Figure 1-2) was used as a template for the design of the tidal wetland restoration component. For example, the perimeter levee of the site would be breached in four locations to restore tidal circulation. These breaches are located in close proximity to the mouths of the major historic tidal sloughs (Figure 1-2). In addition, approximately 22,000 linear feet of tidal channels would be excavated to improve tidal circulation (i.e., flooding and draining). The alignments of the tidal channels are analogous to the major historic sloughs, with some deviations to accommodate the managed pond levee (Figures 1-2 and 2-4).

A 175-acre managed pond would be created in the location of CB1 through CB3. For the purposes of this document a managed pond is defined as an open-water area managed to provide foraging, roosting, and rafting habitat for waterfowl and shorebirds. Incorporating a managed pond into the project area landscape will benefit a broader range of wildlife species and would ensure that habitat and species diversity are maintained over the long-term. In the winter the managed pond would be operated to benefit waterfowl, and in the spring the water level would be drawn down to benefit shorebirds.

Modifications would be made to the levee system in the project area. The perimeter levee would be improved along the eastern portion of the project area to provide flood protection at a level similar to the existing conditions. Ecotone (i.e., transitional) habitat would be created or enhanced along much of the eastern perimeter levee. Some internal levees would be breached and/or lowered to improve tidal circulation and provide habitat benefits such as reducing predator access and establishing roosting areas.

Public access improvements would include a staging area with parking, picnicking and restrooms facilities (Figure 2-3). A non-motorized watercraft (e.g., canoes and kayaks) launch area would be developed at the existing boat dock and ramp in the barge channel. A public trail system would be created along the perimeter levee, with potential connection to regional trails. Infrastructure improvements would include realignment of the site access road and installation of a potable water utility line. An educational interpretive center is envisioned for the future.

The proposed project would result in a landscape comprised of multiple habitat types. Tidal habitats would cover approximately 72 percent of the site and encompass over one thousand acres of tidal marsh, tidal flats and channels. Although predominantly tidal, the proposed project's habitats would be diverse. Managed pond would cover approximately 175 acres (12 percent of the area) and would include approximately 16 acres of islands suitable for roosting (Table 2-2). The area also includes seasonal wetlands (30 acres), ecotone (50 acres of habitat transitioning between wetland and upland), and 52 acres of uplands. Because Green Island was upland amid the historic marshes the site presents a rare opportunity to restore a full continuum of habitats from subtidal channels to upland. Detailed descriptions of these habitats and other components of the proposed project are provided in the following sections.

Table 2-2
Land Area of Proposed Project Components

Land Cover	Acres	Percent
Tidal Marsh	967	66
Managed Pond	175	12
Tidal Channels	86	6
Levees, Roads and Trails	84	6
Uplands	52	4
Tidal Marsh Ecotone	50	3
Seasonal Wetlands (Ecotone Community, Pickleweed Community)	30	2
Islands in Managed Pond	16	1
Total	**1,460**	**100**

2.2.2 Tidal Areas

The principal factors that influence the initial stages of tidal wetland restoration projects are tidal circulation and existing site topography. The proposed project would restore tidal circulation to the site by breaching the perimeter levees and excavating tidal channels in the salt ponds. Breaches in the perimeter levees are necessary for reintroduction of tidal action, and excavation of a channel network is needed so that the tidal basins would flood and drain in a normal tide cycle.

The habitat types that would result from the reintroduction of tidal action is largely dependent on the relationship between existing topography and tidal datums. Table 2-3 shows the tidal datums estimated for the project area.

Table 2-3
Tidal Datums for the Project Area[a]

Tidal Datum	Feet NAVD 88[b]
100-year High Tide[c]	9.06
Mean Higher High Water (MHHW)	6.21
Mean High Water (MHW)	5.62
Mean Sea Level (MSL)	3.31
Mean Low Water (MLW)	0.94
Mean Lower Low Water (MLLW)	0.08

a. Elevations based on mean data from National Oceanic and Atmospheric Administration (NOAA) Station 9415415 (Edgerley Island, MLLW datum). Conversion from MLLW to NAVD 88 based on an interpolation between conversions documented at NOAA Stations 9415218 (Mare Island Naval Shipyard) and 9415623 (Napa River).

b. All elevation data in this document are referenced to North American Vertical Datum (NAVD) 88.

c. Federal Emergency Management (FEMA) Agency flood Insurance Study (FEMA 1990).

Figure 2-5 shows the existing site topography. Diking of the wetlands in the project area for agriculture and salt production has resulted in subsidence. It is assumed that prior to diking the tidal marshes in the project area were at elevations approximating MHHW. Evidence to support this assumption includes the existing elevation of Fagan Marsh and other undisturbed tidal wetlands in the project vicinity, and that mature tidal marshes in the San Francisco Bay estuary generally reach an equilibrium elevation that approximates MHHW. Existing average elevations and elevation ranges of the salt ponds units are shown in Table 2-4.

Table 2-4
Existing Elevation of Salt Ponds in Project Planning Units

Planning Unit	Average Elevation	Minimum Elevation	Maximum Elevation (excluding levees)
	Feet NAVD 88		
North Unit (Ponds 9 and 10)	2.5	1.1	5.1
Central Unit (W1, W2, W3)	3.6	2.2	10.1[a]
South Unit (CB4 through CB9)	2.3	1.4	2.6
South Unit (B-1, B-2, B-3, and Unit 3)	3.2	1.8	14.7[a]

a. Maximum elevations in the Central and South Units occur in isolated areas of fill material associated with dredging (Central Unit) or levees (South Unit). The average elevation of the planning unit provides a more useful indication of existing site topography.

Assuming complete tidal circulation, the relationship between existing site topography and tidal datums dictates the types of wetland habitats that would occur at the time of restoration. *Subtidal* habitat is always submerged, occurring below extreme low water.[3] Subtidal areas provide habitat for fish and other aquatic organisms. Tidal channels excavated to improve marsh circulation would provide intertidal and subtidal habitat for fish, invertebrates, birds and other aquatic organisms. *Intertidal mudflat* occurs between MLLW and MSL. By definition mudflat is devoid of macrophytic vegetation, but often supports multiple species of algae. Intertidal mudflat would provide foraging habitat for shorebirds at low tide, and may be utilized by fish and waterfowl at high tide. *Tidal Marsh* is vegetated wetland that is subject to tidal action. This habitat would occur between MSL and the maximum extent of the tides. Two zones of tidal marsh are distinguished, low and high marsh. *Low Marsh* occurs at elevations from slightly above MSL to slightly below MHW. In the North Bay Pacific cordgrass (*Spartina foliosa*) and bulrushes (*Scirpus robustus* or *maritimus, S. acutus, S. californicus, S. americanus*) occupy low marsh. *High Marsh* occurs between MHW to slightly above MHHW. Pickleweed intergrades with bulrush, e.g., three-square (*Scirpus americanus*) in the lower sections of this zone while salt grass (*Disticlis spicata),* Baltic rush (*Juncus balticus*), and gumplant (*Grindelia stricta)* are common plants found in the highest marsh zone that gradually transitions to upland. The high marsh/transition zone is referred to as *Ecotone* habitat.

2.2.2.1 Tidal Habitat Evolution

A sediment mass balance model was developed to predict and quantify the geomorphic evolution of the tidal marsh. A description of this analysis is provided in the Modeling Technical Memorandum 1 (URS 2005a) (Appendix A). Figures 2-6a through 2-6c show the predicted development of tidal marsh for each planning unit. The analysis is based on average elevations and internal dimensions (i.e., levees are not included) of each pond, and does not consider the placement of additional fill in the North Unit or creation of ecotone. Additionally, the analysis does not consider the area that would be occupied by tidal channels (both constructed and those that would develop through natural processes).

[3] No local data are available for extreme low water; thus, subtidal habitat is considered to be below MLLW.

In the initial years following reintroduction of tidal action, intertidal mudflat habitat would dominate because the majority of the site is below MSL (Figures 2-5, 2-6). However, portions of the site are currently at elevations suitable for low and high marsh habitats (Table 2-4; Figures 2-5, 2-6). Colonization by vegetation would occur most rapidly in these topographically higher areas. Vegetation would spread from the higher areas. As sedimentation from tidal action raises the marsh to elevations above MSL, a progressive colonization of the site by low marsh vegetation would occur in multiple independent locations. The vegetated marsh plain would trap sediment, and over time low marsh would transition to high marsh.

Low marsh will develop rapidly in portions of the Central Unit and Ponds B1, B2, and B3 in the South Unit (Figures 2-6b and c). In the Central Unit vegetation colonization should begin soon after breaching and the model suggests that the average elevation would reach low marsh elevation within 4 years (Figure 2-6b). The majority of the North Unit, given existing elevations and modeled sediment accumulation, should be suitable for low marsh vegetation within 10 years (Figure 2-6a). The eastern edges of the South Unit would likely be where low marsh establishes first (Figure 2-5), but the crystallizer beds would take longer to reach low marsh elevation (Figure 2-6c). By approximately 12 years after introducing tidal action the average elevation should be at low marsh elevation. This low marsh and its associated channels would provide potential foraging habitat for the California clapper rail and juvenile salmonids.

As the marsh plain continues to accrete to an elevation approximating MHW pickleweed, or the site-specific climax vegetation community, will replace the low marsh species as the dominant vegetation. The modeling suggests that at 65 to 75 years after breaching the majority of the tidal marsh plain will reach an elevation approximating MHHW. When the climax marsh has developed, the marsh plain would provide more habitat for locally threatened and endangered species (listed species) such as the salt marsh harvest mouse, California and black rails, and the San Pablo song sparrow.

2.2.2.2 Tidal Restoration Design

The NPSR project has conducted hydrodynamic modeling to develop design criteria that would optimize conditions for restoration of tidal habitats. Specifically, the modeling has been used to develop the levee breach and tidal channel dimensions for the proposed project and project alternatives. The details of the hydrodynamic modeling are provided in the project Modeling Technical Memorandum 1 (URS 2005a) in Appendix A.

To restore tidal action four levee breaches are proposed: one in the North Unit, one in the Central Unit, and two in the South Unit. The locations of the levee breaches are shown on Figure 2-4. The breaches are in close proximity to the locations of the historic slough channel alignments (Figure 1-2). Table 2-5 shows the approximate breach dimensions and tidal basin area served by each breach. The breach widths shown in Table 2-5 are the maximum that would be excavated to restore tidal circulation. The actual breach dimensions will be determined in further hydrodynamic analysis during final project design.

The ebb and flow of tides provide many key restoration actions, e.g., sedimentation, erosion, and seed dispersal. The construction of tidal channels improves circulation and facilitates restoration. The proposed project would excavate as much as 22,100 linear feet of channels to improve tidal circulation. The total excavation volume would be approximately 500,000 cubic yards. Approximately 95 percent of the excavation would occur within the footprint of the historic

slough channels. Slight deviations from the historic slough alignments are required to accommodate the managed pond levee on the east side of CB 3 and the breach location in Pond 9.[4]

Table 2-5
Summary of Major Tidal Restoration Actions

Restoration Unit	Breach Width[a] (Feet)	Channel Excavation[a, b] (Linear Feet/cubic yards)	Associated Drainage Basin (Acres)
North Unit	330	6,500/66,000	167
Central Unit	200	0/0	94
South Unit (CB 8 Breach)	660	13,000/287,000	700
South Unit (Pond B-3 Breach)	130	2,600/48,000	146

[a]Breach widths and channel excavation are based on preliminary calculations and modeling, and are estimates of the maximum that would be required for restoring tidal circulation. The actual breach dimensions and channel excavation volumes will be determined in further hydrodynamic analysis and detailed design of the proposed project.

[b]Volumes do not include breach excavation.

North Unit

The North Unit would be hydrologically connected to Fagan Slough via a breach in the Pond 9 levee (Figure 2-4). A large tidal channel would be excavated in the North Unit to facilitate flooding and draining of the tidal basin. Prior to breaching the levee in Pond 9, fill material would be placed in portions of Pond 10 at three elevations to create three types of habitat. Fill would be placed to raise the pond bottom elevation to approximately MSL to reduce the duration and depth of ponding and accelerate the marsh evolution and revegetation process. The priority would be to fill areas closest to the Napa County Airport Runway 6/24 basic flight pattern. Ecotone would be created adjacent to the southeastern Pond 10 levee by placing fill between MHW and the 100-year tide elevations (Table 2-3 and Figure 2-4). Finally, upland (at elevations above the 100-year tide) would be created nearest to the western end of Napa County Airport Runway 6/24[5]. These conditions would render Pond 10 less attractive to large water birds.

Central Unit

The Central Unit restoration area would be approximately 94 acres. A breach in the Pond W1 levee would reconnect the basin to the Napa River via the barge channel. The wash ponds have an average elevation of 3.6 feet; therefore, much of the area would be suitable for colonization by low marsh vegetation soon after tidal action is restored. Hydrodynamic modeling suggests that the basin would flood and drain without excavating a pilot drainage system (Appendix A).

Opening the wash ponds to tidal action would be beneficial for wildlife, as well as public access components of the project. Tidal exchange between the wash ponds and the Napa River would

[4] The breach location is offset to the east of the historic channel alignment because it needs to be located on DFG-owned land.

[5] This fill would be compatible with Napa County Airport's potential future construction of a Runway Safety Area.

prevent the barge channel from completely filling with sediment and vegetation. Maintaining an open-water channel is desirable so this area can be used for launching non-motorized watercraft.

Currently, the barge channel is approximately 250 feet wide. This width is maintained by periodic dredging. Hydraulic geometry relationships developed for San Francisco Bay estuary tidal marshes (Williams et al. 2002) were used to estimate the barge channel width that would be maintained by tidal action in the wash ponds. If the wash ponds were restored to tidal action in their current conditions, the tidal prism (i.e., the total volume of water exchanged between MLLW and MHHW) would maintain a channel top width of approximately 150 feet. Over time sediment deposition in the wash ponds would decrease the tidal prism. The equilibrium tidal prism is expected to maintain a channel top width of approximately 75 feet. Placement of the breach location in the final design will maximize channel scouring near the boat launch dock and ramp.

South Unit

Two tidal drainage areas would be restored in the South Unit. Like the North Unit, the channel and breach locations were selected based on the historic marsh condition (Figure 1-2). The proposed project would excavate breaches and tidal channels in locations analogous to the historic marsh (with small deviation to accommodate the managed pond levee). Recreating a significant portion of the historic drainage pattern would expedite the restoration of the tidal marsh by providing adequate channel volume to flood and drain the site. Sediment-laden tidal inflow would deliver sediment to build the marsh plain. Figure 2-6 provides the estimated rate of marsh plain accretion based on sedimentation modeling. As discussed in Section 2.2.1.1, much of the South Unit would be intertidal mudflat for several years following restoration of tidal action, and would provide foraging habitat for shorebirds at low tide and roosting and foraging habitat waterfowl during high tides. Ponds B-1, B-2, B-3, and Unit 3 have significant area (150 acres) that would be suitable for colonization by low marsh vegetation at the time of tidal restoration (Figure 2-6c).

2.2.3 Managed Pond

As mentioned in Section 2.2.1 the managed pond would be created in the location of CB1 through CB3. The internal levees between these crystallizer beds would be lowered and breached to allow unobstructed flow between CB1, CB2, and CB3, creating a single 175-acre managed pond. The pond bottoms would be graded to provide topographic relief capable of sustaining multiple water depths for both short- and long-legged shorebirds and wading birds. Islands in the managed pond (i.e., areas of high ground) would be created to provide protected nesting and roosting habitat (Figure 2-4).

Water control structures would be constructed for operation of the managed pond. Two sets of structures would be constructed: one in the northwest corner of CB1 and one in the southwest corner of CB1 (Figure 2-4). Each water control structure would consist of multiple large diameter PVC gated culverts bisecting the levee and extending into the Napa River. Water control devices (e.g., flashboard risers) would be installed on the pond side of culverts to manage water levels. The water-level control devices would be constructed of corrosion-resistant materials such as stainless steel and rubber-coated wood. A management platform would be constructed to facilitate safe access to the gates.

The managed pond area would contain water year-round. Water would be approximately 2 to 3 feet deep and salinity would be low in the winter to provide habitat for waterfowl. In the spring the water depth would be lowered to less than 1 foot, and salinity would increase passively (via evaporation), to create optimal shorebird foraging conditions. The ponds could also be drained or flooded rapidly, if necessary, using the multiple water control structures. Operation of the water control structures would assist in controlling the spread of avian disease and growth of mosquito larvae, managing water quality, and/or avoiding intake of fish.

2.2.4 Ecotone

Approximately 50 acres of ecotone habitat would be created in the project area (Figure 2-4). Gentle slopes (approximately 8 horizontal:1 vertical) would be graded along sections of the perimeter levees that are contiguous with adjacent upland (e.g., eastern edge of Ponds B-1 and B-2). In areas where a broad ecotone is less appropriate because wetland habitat exists on the outboard side of the levee, fill material would be added to the inboard side of the perimeter levee, to create a habitat "bench." The habitat bench would be narrower than the broad ecotone. It would provide high tide refugial habitat and keep erosive forces farther from the levee core.

Ecotone could provide habitat for a variety of wildlife species including, but not limited to, salt marsh harvest mice and other small mammals; foraging habitat for raptors such as hawks, kites, and falcons; and nesting habitat for marsh-associated passerine bird species such as San Pablo song sparrow and San Francisco common yellowthroat.

2.2.5 Levees

The existing levee that forms the western and southern boundaries of the project area provides de facto flood protection for land east of the Napa Plant Site. It was not designed or constructed for the purposes of flood protection. Portions of this levee would be breached to restore tidal action to the project site. The project would maintain the existing level of flood protection by improving the levee along the eastern perimeter of the site to an elevation similar to the existing outboard levee. The levee would have a minimum elevation of 10 feet. The perimeter levee would also serve an important function by providing maintenance access and a public trail system. Details of the trail system are provided in Section 2.3.5. The north and western portions of the perimeter levee that separates Ponds 9 and 10 from Fagan Marsh Ecological Reserve and the Napa River would be lowered to approximately MHW. This would improve connectivity between the restored wetlands and the existing marsh to the north and the Napa River to the west.

The ponds also contain internal levees used to confine and direct brines during salt production. Several thousand feet of internal levees are associated with the salt ponds and water conveyance channels. Construction of the proposed project would require manipulation of the internal levee system to achieve various hydrologic, biological, and physical objectives. Internal levees would be graded to maximum elevation of MHW and breached in strategic locations to provide hydrologic connection between the major excavated channels and the marsh plain. The internal levees would be disconnected from the perimeter levee to discourage predator access.

The internal levees that remain in place would act as wave breaks that reduce fetch across ponds. Reducing fetch distance would decrease the potential for wind-wave-induced erosion on the eastern perimeter levee, and promote conditions for deposition of suspended sediment. In

addition, these levee sections would provide topographic variation and would be inundated by the tides for a shorter duration than the pond bottoms; thus, they could provide roosting habitat for birds.

Some of the levee material salvaged from the grading and breaching of the levees would be used to fill borrow ditches and create ditch blocks. Borrow ditches are depressions along the toe of levees that result from material being dredged for levee maintenance. Ditch blocks are earthen plugs or small levees that prevent hydrologic short-circuiting into borrow ditches or water conveyance channels. Strategically placing ditch blocks will ensure that tidal waters flow to the preferential channels.

2.2.6 Uplands, Public Access and Facilities

The proposed project would utilize upland areas for site access, public access facilities, and DFG personnel housing. The existing site access road bisects Ponds W1 and W2. In the proposed project the wash ponds would be restored to tidal action. The existing road alignment is problematic for several reasons. The access road would need to be raised to prevent flooding. Moreover, the road would be difficult to maintain, and it would create a biological and hydraulic barrier in the marsh, impeding restoration processes. The proposed realignment would locate the site access road south of Pond W3 and north of CB5 and CB6 (Figure 2-4), allowing the wash pond complex to function as a single hydrologic unit. Ecotone would be created to the north and south of the new road grade to provide a wildlife buffer between the road and the marsh, and to protect the road from wind-wave-induced erosion (Figure 2-4).

Gates on the site access road would be used to restrict public vehicle access to daylight hours. A DFG employee would reside in the existing residential housing on Green Island. The DFG warden for the NSMWA would patrol the site on a regular basis.

Currently, the plant site has no potable water utility. Potable water is delivered to the site by motor vehicle. A new potable water line would be installed to provide a reliable source of potable water to the site. The water line would be connected to the existing City of American Canyon water line on Green Island Road. The connection would require 4,700 feet of new water line. All of the line will be placed subgrade. Connections at the site would be made for DFG facilities on Green Island, and public access and maintenance buildings.

Public access and recreation components would include a primary staging area for parking, picnicking, restrooms, and boat launching centered around the barge channel (Figure 2-3). Hand-launching of non-motorized watercraft (e.g., canoes and kayaks) would be possible at the existing boat dock and ramp in the barge channel. Connections to bicycle lanes on Green Island Road and future connections to other outlying areas would be facilitated. A perimeter trail would be developed to support both pedestrians and cycling. The trail has the potential to connect with a regional trail network. The NPSR project team is working with the City of American Canyon to coordinate trail connection opportunities near the end of Eucalyptus Road. Smaller nature trails with interpretive signage would also be developed. In the long term, DFG would like to create an environmental interpretive center on the property. The site access road and upland staging area presents a unique opportunity for locating an interpretive center adjacent to the Napa River and its wetlands.

New upland will be constructed in Pond 10, adjacent to the Napa County Airport's Runway 6/24. This proposed upland area is consistent with the airport's planning for safety features.

2.2.7 Land Use Planning

DFG intends to manage the North Unit as part of the Fagan Marsh Ecological Reserve, and the Central and South units as the Green Island Unit of the NSMWA. Land use in these areas would be consistent with the DFG management designations. For example, waterfowl hunting may be allowed in the South Unit, but not in the North Unit, because hunting is not a permissible activity in DFG Ecological Reserves. The rules and regulations for Wildlife Areas and Ecological Reserves are promulgated in Fish and Game Code Sections 1525-1530 and 1580-1586, respectively.

The proposed project is cognizant of Napa County Airport's current planning process to create a 1,000-foot long runway safety area (RSA) and a 1,000-foot runway protection zone (RPZ) for Runway 6/24. The RSA and RPZ would need to be constructed on lands in and adjacent to Pond 10. The proposed project will not conflict with or preclude Napa County Airport from planning and implementing this activity.

DFG is working with the Napa County Flood Control and Water Conservation District (Napa Flood District) to explore the possibility of using the North Unit as a one-time dredge material disposal site for the Napa River maintenance dredging project. The United States Army Corps of Engineers (USACE) and Napa Flood Control conduct the maintenance dredging on an approximately 6-year cycle. The maintenance dredging occurs on two river segments: the downstream portion, which extends from Mare Island Causeway to Asylum Slough, and the upstream portion, which extends from Asylum Slough to the Third Street Bridge in the city of Napa. The NPSR project is in the downstream portion of the maintenance dredging area. The last dredging event in the downstream portion of the Napa River was completed in November 1999, and the next event is scheduled for fiscal year 2006 pending availability of funds (USACE 2005). The dredging could generate as much as 300,000 to 400,000 cubic yards of material from the area near the NPSR project site (M. Forte, pers. comm., 2005). Placing this volume of material on pond bottoms could raise their elevation and accelerate the marsh development process.

Napa Flood District would need to obtain the permits necessary to use the ponds as a beneficial dredged material reuse site. Placement of dredged material in the ponds of the project area is consistent with goals and objectives developed for the Long-Term Management Strategy for Placement of Dredged Materials (LTMS) in the San Francisco Bay Region. The LTMS recommends beneficial reuse of dredged materials for wetland restoration projects. Using the ponds of the project area as a reuse site would also minimize environmental impacts associated with transportation and disposal of material dredged from the Napa River.

DFG is also coordinating trail connection opportunities with the City of American Canyon and Napa County to facilitate public access to the project area. The City identified trail opportunities that could connect to the southern end of the proposed project area in the *Wetlands Edge Bay Trail Concept Plan* (LandPeople et. al. 2002). Napa County also identified trail opportunities in the *Airport Area Bicycle Route Study* (LandPeople et. al. 2005). The trail planned for the eastern perimeter of the proposed project area would provide a critical link to these local plans as well as the regional San Francisco Bay Trail.

2.2.8 Construction

Implementation of the proposed project would include the following major components:

- Breaching external levees
- Excavation of tidal channels
- Levee modifications
- Placement of fill
- Installation of water control structures
- Realignment of the site access road
- Public access improvements
- Installation of a potable water line to the plant site, along Green Island Road

The details of these activities follow.

2.2.8.1 Breaching of External Levees

Breaching external levees would require the use of heavy equipment such as excavators and haul trucks. Placement of temporary cofferdams or excavation from barges may also be necessary for breach construction. Installation of sheet pile to create cofferdams may use an excavator or a crane with a vibratory hammer to drive the sheets. The majority of material excavated from the breaches would be used on-site for improvement of existing levees or fill for the ecotone areas. Material excavated from breaches that is not suitable for on-site reuse (e.g., rebar and concrete debris) would be recycled or disposed of off-site. The breaches would be opened to tidal circulation when the ponds are dry, minimizing the potential for adverse water quality conditions associated with the discharge of high salinity water or excess sediment.

2.2.8.2 Excavation of Tidal Channels

Excavation of the tidal channels would require the use of heavy equipment such as low ground pressure, long reach excavators. Preliminary earthwork analyses show approximately 480,00 cubic yards (300 acre-feet) of material would be generated from excavation of new channels. All of this excavated material would be reused on-site to raise the marsh plain elevation, create wave breaks[6], ditch blocks or levees. Much of the excavated material would be side-cast and graded into the adjacent marsh plain. Dozers, scrapers and/or haul trucks may be used to distribute the material throughout the project area.

2.2.8.3 Levee modifications

Levee improvements would require the use of heavy machinery such as dozers, scrapers, and compaction equipment. All of the fill material needed for levee improvement is anticipated to

[6] Wave breaks are low relief mounds constructed perpendicular to the prevailing wind direction to shorten fetch distances and mute wave generation.

come from on-site resources such as existing levees, upland excavation and dredged material. Internal levees would be lowered using similar heavy equipment.

2.2.8.4 Placement of Fill

Fill material would be placed for multiple reasons: (1) to create ecotones, (2) to accelerate vegetation establishment, (3) to create habitat islands in the managed pond, (4) to create upland and (5) to improve levees (as described above). Placement of fill material would require heavy machinery such as dozers and scrapers. Ecotone fill would be placed adjacent to levees and the new site access road. Raising the elevation of select areas to accelerate vegetation establishment (such as in Pond 10) would require placement and compaction of fill material. The fill would come from excavation of tidal channels, existing on-site dredged material stockpiles, or material generated from the next Napa River dredging project. The amount of fill material placed would be based on availability and funding. Construction activities associated with using the North Unit as a dredged material reuse site for Napa River maintenance dredging are not considered part of the proposed project.

2.2.8.5 Installation of Water Control Structures

Installation of water control structures would require the use of heavy equipment including excavators and possibly truck mounted cranes to place large-diameter pipes and gates. Placement of temporary cofferdams on the Napa River side of the perimeter levee may also be necessary for installation of the water control structures.

2.2.8.6 Realignment of the Site Access Road

Realignment of the road would require the use of heavy machinery such as excavators, dozers, scrapers, and compaction equipment. Fill material needed for the road grade is anticipated to come from on-site resources such as existing levees and dredged material. Road base material would be imported to the site for the road surface, or salvaged from the existing site access road. Demolition of the existing access road would require excavators and haul trucks to remove the asphalt surface, and dozers to grade the road into adjacent marsh plain. Asphalt removed from the road surface would be disposed of at an off-site location.

2.2.8.7 Public Access and Facilities Improvements

Constructing public access and facility improvements would require the use of heavy machinery such as excavators, dozers, scrapers, and compaction equipment. Fill material needed for trails is anticipated to come from on-site resources such as existing levees and dredged material. Gravel for trail base material would be imported to the site.

2.2.8.8 Installation of a Potable Water Line to the Plant Site, Along Green Island Road

Installation of the water line would require excavation with trenching equipment, placement of bedding material, backfill, and compaction. All existing surface features and covers would be replaced in kind.

2.2.9 Environmental Protection Measures

DFG is proposing to employ a variety of environmental protection measures as part of the proposed project. These measures are described below.

2.2.9.1 Geotechnical Considerations

The proposed project would maintain the existing level of flood protection by improving the levee along the eastern perimeter of the site to an elevation similar to the existing outboard levee. To evaluate the condition and stability of the existing levee, a geotechnical field investigation and engineering analyses will be performed. Properly designed engineering measures for the perimeter levee will be implemented to allow it to withstand seismic events to the extent practicable. All levees will also receive regular maintenance.

In the event that unstable geologic units or soils are encountered during construction of the gated culverts, the contractor will remove such materials and will backfill with engineered fill meeting the required specifications for compaction and shear strength. The proper operation of the gated culverts will be verified periodically, and the structures will be properly maintained and replaced as needed.

Structures will be designed and constructed in accordance with applicable engineering standards and building codes. Thus, shrink-swell behavior would not pose a risk of personal injury, loss of life, or significant damage to property. In the event that unstable geologic units or soils are encountered during construction, the contractor will remove such materials and will backfill with engineered fill meeting the required specifications for compaction and shear strength.

Areas of grading and other construction activity will be designed to minimize runoff. The use of temporary controlled drainage measures, including straw rolls, visquene covering, and silt fences will minimize erosion and runoff during construction. Placement of engineered fill (and geotextile fabric or other protection measures) to the in-board side of perimeter levee will provide protection from erosion and piping due to repeated water-level fluctuations. Properly designed and implemented drainage plans will minimize post-construction erosion.

Special dewatering measures will be designed and implemented to allow excavation in areas where shallow groundwater is present. In areas where unstable ground and/or saturated soils are encountered during earthwork activities, the contractor will take measures such as temporarily placing a bridging layer of granular fill or geotextile to facilitate planned activities. Below-grade structures and facilities, in particular, the proposed large-diameter culverts with slide gates for the managed pond unit, will be designed to withstand excessive water pressure and infiltration.

2.2.9.2 Hazards and Hazardous Materials Considerations

Construction contractors working on the project will be required to provide their employees with enhanced spill prevention and response training, and will be required to have spill response equipment available at the job site, as directed by the project sponsors. Contractors will provide double containment for any hazardous materials or wastes at the job site. Contractors will be prepared to respond to any spill immediately and to fully contain spills in the project area, including any open-water areas.

During project excavation activities associated with the new water supply pipeline, the contractor will inspect the exposed soil for visual evidence of contamination. If visual contamination indicators are observed during excavation or grading activities, all work will stop and an investigation will be designed and performed to verify the presence and extent of contamination at the site. Results will be reviewed and approved by Napa County's Environmental Health Division or DTSC prior to continuing construction. The investigation will include collecting samples for laboratory analysis and quantification of contaminant levels within the proposed excavation and surface disturbance areas. Subsurface investigation will determine appropriate worker protection and hazardous material handling and disposal procedures appropriate for the subject site. Areas with contaminated soil and groundwater determined to be hazardous waste will be removed by personnel who have been trained through the OSHA-recommended 40-hour safety program (29 CFR 1910.120) with an approved plan for groundwater and soil remediation, control of contaminant releases to the air, and offsite transport or on-site treatment. A health and safety plan, prepared by a qualified and approved industrial hygienist, will be used to protect the general public and all workers in the construction area.

The project sponsors will ensure that a site-specific health and safety plan is developed and implemented by the contractor as part of contract specifications. At a minimum, the contractor's health and safety plan must show how the contractor will comply with the nuisance dust standard set by Cal/OSHA in the immediate work area and at the perimeter of the work area.

2.2.9.3 Water Quality Considerations

A Stormwater Pollution Prevention Plan (SWPPP) and a Stormwater Monitoring Program will be developed and implemented. The Clean Water Act, National Pollution Discharge Elimination System (NPDES) (33 United States Code 1342) requires that construction projects disturbing more than 1 acre of land must develop and implement a SWPPP. Implementation of the Best Management Practices in the SWPPP will reduce potential stormwater impacts to less than significant.

Impacts to the Napa River will be minimized by constructing the proposed project's breaches while the ponds are dry and by controlling the timing, rate, and concentration of discharges from the managed pond. The proposed project would avoid discharging water from the managed pond to the Napa River in an abrupt manner. Discharge from the managed pond will be minimized during salmonid migration in the river from December 1 through April 30.

The project will comply with the Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements or NPDES permit conditions that may be issued for the project.

2.2.9.4 Noise Considerations

The following control measures will be incorporated into the project contract specifications to minimize construction noise impacts:

- Monitor construction noise levels at project perimeter to demonstrate compliance with Napa County Noise Control Regulations. If noise regulations are violated then either restrict equipment operation to appropriate construction hours or employ shrouds, shields, or other noise-reducing features to reduce noise to a level that complies with the County regulations.

- All noise-producing project equipment and vehicles using internal combustion engines (including haul trucks) will be fitted with mufflers and air-inlet silencers where appropriate. These devices will be maintained in good operating condition so as to meet or exceed original factory specifications. Mobile or fixed "package" equipment (e.g., air compressors) will be equipped with shrouds and noise control features that are readily available for that type of equipment.
- All mobile or fixed noise-producing equipment used on the project, which is regulated for noise output by a local, state, or federal agency, will comply with such regulation while in the course of project activity.
- At least 20 days prior to commencement of construction, the contractor will provide written notification to property owners and residents within 500 feet of the project area, to surrounding homeowners associations, and posted at the access to the construction site. The notice will provide a construction schedule, required noise conditions applied to the project, and the name and telephone number of the Project Manager who can address questions and problems that may arise during construction.
- The use of noise-producing signals, including horns, whistles, alarms, and bells will be for safety warning purposes only.
- Electrically powered equipment instead of pneumatic or internal combustion powered equipment will be used, where feasible.
- The contractor will develop a construction noise control plan, which will have been approved by DFG prior to commencement of construction activity.

2.2.9.5 Light and Glare Considerations

All outdoor lighting will utilize directional lighting methods with shielded and cutoff type light fixtures to minimize glare and upward directed lighting.

2.2.10 Project Phasing

The project would be implemented in two major phases. The phasing is based primarily on the land transfer agreement between DFG and Cargill as it applies to salinity reduction on the site. Cargill is planning on having the North Unit, and potentially the Central Unit, available for restoration by 2007. The South Unit would be available for restoration at some time between 2010 and 2012. The proposed phases would include the following construction activities:

2.2.10.1 Phase 1: North Unit activities (2007)

- Lowering of levee between Ponds 9 and 10 and Fagan Marsh
- Excavation of tidal channels in Ponds 9 and 10
- Levee improvements on the southern and eastern perimeters of the North Unit
- Placement of fill in Pond 10
- Excavation of a breach in the Pond 9 levee

2.2.10.2 Phase 1: Potential Central Unit activities (2007)

- Installation of a potable water line
- Levee improvements on the perimeter of the Central Unit
- Realignment of site access road
- Excavation of breach in W1 levee

It is anticipated that Phase 1 activities could be completed in one construction season, which takes into account the potential for construction windows limited by listed species breeding season and migration restrictions. Phase 1 may include some Central Unit construction activities if salinity reduction in the wash ponds and the need to use the dredged material handling area in Pond W1 are completed by 2007. The timing of Phase 1 could be also be affected by the Napa River maintenance dredging schedule. If the river dredging occurs in 2006, then the North Unit may be made available to Napa County for dredged material disposal if they obtain the required permits. If the Napa River dredging occurs in 2007 it would coincide with the project construction activity. Phase 1 for the Central Unit could be postponed until 2008 if the Napa River dredging is further delayed. Placement of dredge material from the river would only be accepted prior to breaching and introduction of tidal action to the ponds.

2.2.10.3 Phase 2: Central and South Units (between 2010 to 2012)

- Installation of a potable water line (if not completed in Phase 1)
- Excavation of tidal channels in the South Unit
- Levee improvements on the perimeter of the central and South Units
- Realignment of site access road (if not completed in Phase 1)
- Internal grading for managed pond levees and habitat features
- Water control structure installation
- Public access and facilities improvements
- Excavation of breaches in CB8, B-3, and W1 (if W1 breach is not completed in Phase 1)

It is anticipated that Phase 2 activities could be completed in one construction season, which takes into account the potential for construction windows limited by listed species breeding season and migration restrictions.

2.2.11 Operations and Maintenance

The proposed project would require operation and/or maintenance of the following:

- Perimeter levees
- Managed pond levees
- Water control structures
- Public access features including the boat launch, trails, restrooms, and interpretive signs

- Site access road
- DFG housing
- On-site water service line

Perimeter levees would require inspections for erosion, settlement, excessive burrowing animal activity, and/or presence of deep-rooted woody plants. Maintenance would be conducted if any problems were identified. Managed pond levees would require similar inspections, but maintenance standards would be less stringent.

Water control structures would require ongoing operation and maintenance and possibly replacement or modification in the long term. Public restrooms and trash receptacles would also require regular maintenance. Parking area and the site access road may require regrading or placement of additional road base material.

If potable water service is brought to the site from the City of American Canyon water system, a meter and backflow prevention device will be installed at the main line. A water service line will extend from the meter to the on-site buildings requiring potable water. This line (pipe) and all appurtenances will be the owned and maintained by the property owner.

2.3 PROJECT ALTERNATIVES

Three alternatives to the proposed project have been identified:

- Alternative 1: Full tidal restoration
- Alternative 2: Tidal restoration, managed pond and playa
- Alternative 3: No Project

Alternatives 1 and 2 were developed and evaluated in the project planning process. The project Restoration Management Plan (RMP) (URS 2005b) (Appendix B) details the development and evaluation of the project alternatives. It is important to note that in the project planning process the nomenclature for the project alternatives differed from that which is presented in this document. Table 2-6 shows the changes in nomenclature that will be used for the project from this point forward.

Table 2-6
Nomenclature for Project Alternatives

Prior Nomenclature used in Restoration Management Plan and Hydrology Technical Memoranda	Nomenclature for EIR
Alternative 1: Full tidal restoration	Alternative 1: Full tidal restoration
Alternative 2: Tidal restoration and managed pond	Proposed Project
Alternative 3: Tidal restoration, managed pond and playa	Alternative 2: Tidal restoration, managed pond and playa
None	Alternative 3: No Project

The project alternatives are summarized in the following sections. The public access features for Alternatives 1 and 2 are the same as for the proposed project.

2.3.1 Alternative 1: Full Tidal Restoration

Alternative 1 would restore tidal action to all salt ponds in the project area (Figure 2-7). No managed pond habitat would be created. Alternative 1 would not require construction of managed pond levees, water control structures, and topographic relief for islands within the pond complex. The levee breach in CB8 may be larger than designed for the proposed project because the tidal drainage basin area would be greater; however, the breach size would not exceed 660 feet. All other project components and associated construction activities are equivalent to the proposed project. Alternative 1 would require less long-term operation and maintenance than the proposed project because there are no water control structures and managed pond levees to maintain.

2.3.2 Alternative 2: Tidal Restoration, Managed Pond and Playa

Alternative 2 differs from the proposed project in that the Central Unit ponds (i.e., wash ponds W1, W2 and W3) would function as playa habitat, i.e., the hydrology of the ponds would be dependent on direct precipitation rather than tidal action (Figure 2-8). This condition would produce an environment that would mimic natural playa habitat, which can be defined as "shallow, ephemeral ponds or lagoons that experience significant seasonal changes in semiarid to arid climates … and often have high salinity or may be completely dry" (Aber 2003). In the winter the open-water habitat of the playa would have moderate water salinity and would attract waterfowl. In the spring increased evaporation and decreased precipitation would cause water depths to drop and salinity to rise. This condition would provide suitable foraging habitat for shorebirds. When the ponds are nearly dry in the summer a salt crust would form on the surface, providing potential breeding habitat for ground-nesting birds such as snowy plover and killdeer (*Charadrius vociferous*).

In general, playa habitat hydrology would be based on direct precipitation. However, water control structures would be installed to allow exchange of water to and from the Napa River. Introducing river water could influence salinity concentrations, assist in managing adverse water quality conditions (e.g., low dissolved oxygen), or optimize management for certain wildlife species.

The site access road would not be realigned for Alternative 2 because the wash ponds would not be tidal, allowing the existing road to be operated and maintained in its current condition and location. Additionally, perimeter levees in the Central Unit would not need improvements because maximum inundation would be similar to existing conditions, and pond depth could be managed using the water control structure (Figure 2-8). All other project components and associated construction activities are equivalent to the proposed project, except the potable water line may need to be longer and placed adjacent to the existing site access road.

Alternative 2 would potentially require more long-term operation and maintenance than the proposed project because at least one additional water control structure would need maintenance.

2.3.3 Alternative 3: No Project

In the absence of the proposed project an environment similar to the playa habitat described in Alternative 2 would characterize the Napa Plant Site. When Cargill completes the salinity reduction program the salt ponds would function as seasonal wetlands. The ponds would flood via direct precipitation. Based on contractual agreements between DFG and Cargill related to land transfer conditions, surface water salinity concentrations under the No Project Alternative would be approximately 60 ppt when the ponds are completely filled with rainwater. Water salinity concentrations would vary intra- and inter-annually based on climatic conditions (e.g., precipitation and wind). Salinity would be lower in the winter, and increase in the spring and summer. Water temperatures would rise as water depths decreased, which could decrease dissolved oxygen concentrations although the shallow water depths would facilitate mixing and atmospheric oxygen exchange. The ponds would be nearly dry by summer, with isolated pockets of hypersaline water in topographic low spots (e.g., borrow ditches). Salinity would be conserved in the system because no discharge of water would occur, and the perched groundwater table and clay soils would not allow for significant leaching of salt.

The majority of the seasonal ponds would be devoid of vegetation because of the prolonged duration of inundation and residual salinity. Some halophytic species may be able to colonize the pond margins and areas of higher ground. Some wildlife use would likely occur. The ponds could provide suitable habitat for waterfowl in winter and shorebirds in the spring.

Operation and maintenance of the site would be limited to emergency levee repair, and no public access facilities would be developed under this alternative.

3.0 OVERVIEW OF CEQA COMPLIANCE

This chapter provides an overview of CEQA compliance required for the proposed project, the intent and scope of the EIR, public involvement and scoping, issues of known controversy, consultation and other requirements.

3.1 CEQA COMPLIANCE

CEQA is regarded as the foundation of environmental law and policy in California. CEQA's primary objectives are to:

- Disclose to decision makers and the public the significant environmental effects of proposed activities
- Identify ways to avoid or reduce environmental damage
- Prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures
- Disclose to the public reasons for agency approval of projects with significant environmental effects
- Foster interagency coordination in the review of projects
- Enhance public participation in the planning process

CEQA applies to all discretionary activities proposed to be carried out or approved by California public agencies, including state, regional, county, and local agencies, unless an exemption applies. It requires that public agencies comply with both procedural and substantive requirements. Procedural requirements include the preparation of the appropriate public notices (including notices of preparation), scoping documents, alternatives, environmental documents (including mitigation measures, mitigation monitoring plans, responses to comments, findings, and statements of overriding considerations); completion of agency consultation and State Clearinghouse review; and provisions for legal enforcement and citizen access to the courts.

CEQA's substantive provisions require agencies to address environmental impacts disclosed in an appropriate document. When avoiding or minimizing environmental damage is not feasible, CEQA requires agencies to prepare a written statement of overriding considerations when they decide to approve a project that will cause one or more significant effects on the environment that cannot be mitigated. CEQA establishes a series of action-forcing procedures to ensure that agencies accomplish the purposes of the law. In addition, under CEQA's direction, the California Resources Agency has adopted regulations, known as the CEQA Guidelines, which provide detailed procedures that agencies must follow to implement the law. In general, the CEQA Guidelines (14 California Code of Regulations Section 15382) provide that, if an impact will create an adverse change in the land, water, air, minerals, flora, fauna, ambient noise, or objects of historic or aesthetic significance, then the impact is considered significant. The key elements in the definition presented in the Guidelines are (1) adverse and (2) substantial, or potentially substantial. DFG is the state lead agency and would use this EIR to comply with the CEQA Guidelines and to document CEQA compliance.

3.2 INTENT AND SCOPE OF THE EIR

The intent of this EIR is to disclose the environmental impacts associated with the proposed restoration project. The restoration effort would have substantial habitat benefits by restoring portions of the Napa Plant Site to a mosaic of wildlife habitats consisting of tidal marsh and a managed pond, but may result in significant geologic, land use, and public health and safety effects.

In accordance with CEQA regulations, this document describes the potential environmental effects caused by construction, operation, and maintenance activities related to restoring the Napa Plant Site. It focuses on key issues, including biological resources, hydrology, land use and planning, public health and safety, and water quality. Other resource topics such as air quality, cultural resources, geology and soils, hazardous materials, noise, public services and public access, recreation, and visual resources are also addressed in this document.

3.3 PUBLIC INVOLVEMENT AND SCOPING

Presentations regarding project planning were made to the Napa-Sonoma Marsh Restoration Group on February 18 and July 27, 2005. Representatives from the following groups were present: U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), Wildlife Conservation Board, USACE, Sonoma Land Trust, San Francisco Bay Joint Venture, DFG, Ducks Unlimited, Bay Institute, Cargill, Inc., San Francisco Bay Conservation and Development Commission (BCDC), California Bay Delta Authority, and California Regional Water Quality Control Board San Francisco Bay Region (RWQCB).

Presentations and discussions were held on July 21 and September 22, 2005, with a Science Team established to review and comment on project progress. Representatives from USGS, BCDC, RWQCB, San Francisco Estuary Institute, and Wetlands and Water Resources attended these meetings.

Meetings were held with Napa County staff representing the Napa County Airport and the Napa County Flood Control and Water Conservation District on July 25 and November 8, 2005. On August 30, 2005 a meeting was held with staff from the City of American Canyon and the Napa County Mosquito Abatement District.

A public scoping session was held September 29, 2005, at Donaldson Way Elementary School in American Canyon. Public notices announcing the meeting were published on September 25, 2005, in the Napa Register and Vallejo Times Herald prior to the meeting and over 300 Notices of Preparation were mailed to agencies and local residents.

Specific questions and comments raised during the scoping meeting are included below along with written comments received by the following agencies and citizens:

- RWQCB
- County of Napa
- City of American Canyon
- San Francisco Bay Trail proposed project
- Federal Aviation Administration (FAA)

- Cecil Bruce Shaver, Mayor of City of American Canyon
- John and Judy Ahmann
- Barry Christian
- Terence C. Keenan
- Mathew Keller
- Harold B. Mead

Flooding

- What effects will restoring tidal action to the proposed project area have on flooding in relation to FEMA Flood Maps at the Napa County Airport, adjacent lands, the additional pressure on the back levees, and the railroad tracks?

Napa Airport

- Does the FAA have a mileage (or distance) of clearance from the airport?
- Does the CEQA exemption supersede FAA rules?
- Is there a "no project" alternative? Napa County Airport likes the salt ponds and prefers the "no project" alternative.
- The EIR should identify and mitigate all potential conflicts associated with short- and long-term increases in bird activity with the Napa County Airport and consider proposed project revisions or mitigation to the proposed project to address any impacts to the goals and objectives outlined in the *Airport Master Plan* (currently being revised) including runway and taxiway extensions, improvement of a runway safety area, construction or perimeter security fencing, acquiring property for a runway protection zone (RPZ), and improving access over Fagan Creek.
- The EIR should address the proposed project's consistency with the joint FAA/USDA publication Wildlife Hazard Management at Airports (Cleary and Dolbeer 2005), the California Department of Transportation, *Division of Aeronautics (Caltrans), and the State of California's Airports Land Use Handbook and the Airport Land Use Compatibility Plan (Napa County 2002)* since the proposed project falls within zones B, C, and D of the plan. The DEIR should also be submitted to the Airport Land Use Commission for review.
- The EIR should consider the potential for the Army Corps of Engineers and the Napa County Flood Control and Water Conservation District to be allowed to place dredged material taken out of the Napa River (to maintain navigation channels and 100-year flood control capacity) in Ponds 9 and 10 to create uplands at the end of the airport runway as partial mitigation for the impacts of increased bird activity in the vicinity of the airport.
- The EIR should assess the negative safety implications of the proposed project, which is believed to be a permanent, not temporary, wildlife attractant, and whether wetlands have the potential to increase hazards to aviation based on the size and nature of the species that could be attracted to the proposed wetlands versus the existing salt ponds. The FAA recommends a

separation distance of 10,000 feet for any wildlife attractant and recommends a 5-mile separation distance for any attractant that could cause hazardous wildlife movement into or across the approach or departure airspace.

- The EIR should address the negative airport growth and operations limitations as well as potential agency liability issues associated with the implementation of the proposed project.

Sedimentation, Salinity, and Water Quality

- The EIR should fully assess potential impacts to erosion, sedimentation, and water quality, and discuss the proposed project's relationship to the Regional Water Quality Control Board's ongoing Total Maximum Daily Load (TMDL) process intended to improve the beneficial uses of the Napa River.
- Managed ponds will need to meet water quality standards. The dissolved oxygen standard has been hard to meet for managed ponds in the South Bay in which influent and effluent discharge points are different. Muted tidal ponds may achieve higher dissolved oxygen levels than managed ponds with more limited tidal influence. If the managed ponds are designed to have elevated salinities, then a National Pollutant Discharge Elimination System (NPDES) permit will be required for the added risk to estuarine aquatic life.
- If dredged material is used to raise subsided elevations, the sediment should be tested (unless there is good reason such as no history of human activity at the site where the sediment was dredged) for the typical suite of chemicals listed in the *Draft Guidelines for Beneficial Use of Dredged Materials* [www.waterboards.ca.gov/sanfranciscobay/Download.htm] or similar guidelines.

Public Access

- The EIR should be consistent with and address public access and planning issues stated in the City of American Canyon *General Plan* (City of American Canyon 2003) and the *Napa-Berryessa Integrated Regional Water Management Plan*, the San Francisco Bay Trail and the *Airport Area Bicycle Route Study*, prepared for the Napa County Department of Public Works (LandPeople et al. 2005), in regards to public access along the Napa River and at the end of Eucalyptus Road, including possible support linkages between the City of American Canyon and the City of Napa, incorporating the restoration of the tidal slough south of the current proposed project area, the Oak Hill and Clark Ranch developments and the effects of additional housing in the area on public access, and public access projects, including Park Ranch, and Master Planning on Eucalyptus Road.
- Will public access facilities in the proposed project area include trails for dogs and equestrians, bridges over levee breaches, hunting in tidal and managed pond areas, educational facilities, and a launch area for non-motorized water craft?
- The EIR should consider proposals to install a shipping channel and railroad spur through the proposed project site to allow ferries to transport commuters to the proposed Sonoma-Marin Area Rapid Transit (SMART) commuter line railroad, which runs through the proposed project area.

Mosquito Abatement

- What are you doing about mosquito related problems, who will do the mosquito control measures for DFG, and would the no project alterative create a mosquito condition?
- Low spots behind high areas are good mosquito habitat. Provide transitional areas to minimize isolated areas.

Maintenance

- Have long-term funding for maintenance needs been assessed (i.e., full-time maintenance staff) and the use of low maintenance materials (i.e., concrete and stainless steel that will not corrode in saltwater) been addressed?

Wildlife/Habitat

- There will be noise from construction, which may limit the construction activities to avoid sensitive species nesting periods (e.g., clapper rail).
- Dogs and cats from homes close to wetlands can be a concern for wildlife and high ground refuge areas for waterfowl should be provided.
- How long has Cargill been producing salt at the Napa Plant Site and has any "adaptive" habitat developed since then that may provide critical habitat to species that should be addressed before conditions are returned to a historic state?

Monetary

- I read that 300 million (dollars) was spent for the purchase of the salt ponds. What portion of that money was for this site?
- Where is the money coming from for construction?

Recommendations/Considerations

- Friends of the Napa River would like to see tidal exchange between the north and south areas considered
- Having a DFG Warden or staff presence at the site will be a positive benefit for the proposed project vicinity.
- The restoration should be managed as freshwater seasonal wetland not salt-water marsh.
- The EIR should address regional issues such as the railroad usage as a commuter line by Sonoma-Marin Area Rapid Transit (SMART).
- The EIR should identify all required approval actions by local, State, and federal agencies, and identify the federal agency acting as the lead under the National Environmental Policy Act.
- Caltrans should be encouraged to participate in the proposed restoration project as mitigation for future improvements to State Route 37 to the south.

Consistency With Other Plans

- The proposed project should be designed in consideration of potential activities and/or future improvements in the vicinity (such as the *Airport Master Plan* (currently being revised), *Airport Land Use Compatibility Plan*, and *Napa County General Plan (*Napa County 2002)) and should assess effects on these potential activities/improvements, including agricultural uses, use of recycled water for irrigation, boating and ferry service on the Napa River; consistency with the Napa County General Plan in relation to the land being designated as Agriculture, Watershed and Open Space (AWOS).

Miscellaneous

- Was a California Environmental Quality Act (CEQA) document prepared for the purchase of the Cargill property?
- How will you determine the preferred alternative?
- In the worst-case scenario, and design elements fail, what is the contingency and liability? Who is responsible?
- Breach depth is more critical than the width. How deep will the breaches be?
- How high are the existing levees and what are the existing elevations of the salt ponds?

3.4 ISSUES OF KNOWN CONTROVERSY

There is much support for the proposed project from both the public and resource agencies. However, there are some areas of controversy associated with the proposed project. The primary issues of known controversy associated with the restoration of the Napa Plant Site are related to the site's proximity to Napa County Airport. The proposed project has the potential to increase the area's attraction to waterfowl and, thus, increase the potential for aircraft bird strike hazards, which in turn could be considered an incompatible land use relative to the airport.

The proposed project has the potential to increase mosquito breeding habitat, which could be a public health concern in the project vicinity. Also, there is concern regarding how the proposed project may affect water quality in the surrounding waters and change the existing hydrology in the project vicinity.

3.5 CONSULTATION AND OTHER REQUIREMENTS

In addition to CEQA, the NPSR project will require compliance with other federal, state, regional, and local environmental laws, including

- Section 7 of the federal Endangered Species Act;
- Magnuson-Stevens Fishery Conservation and Management Act;
- Fish and Wildlife Coordination Act;
- Sections 404, 401, 402, and 313 of the Clean Water Act;
- Clean Air Act;

- Coastal Zone Management Act;
- National Historic Preservation Act;
- Executive Order 11988—Floodplain Management;
- Executive Order 11990—Protection of Wetlands;
- Executive Order 12898—Environmental Justice;
- Migratory Bird Treaty Act;
- McAteer-Petris Act;
- California Fish and Game Code (Section 1600 Lake or Streambed Alteration Agreement program);
- California Department of Transportation encroachment permit requirements;
- Disabilities regulations (Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act); and
- National Pollutant Discharge Elimination System permitting and Section 401 water quality certification processes through the San Francisco Bay RWQCB and State Water Resources Control Board.

4.1 AIR QUALITY

4.1.1 Environmental Setting

4.1.1.1 Sources of Information

Significant portions of this section were developed from the following resources:

- *Napa River Salt Marsh Restoration Project. Final Environmental Impact Report* (NSMRP EIR) (CSCC and DFG 2004)
- California Air Resources Board (CARB), Aerometric Data Analysis and Management System (ADAM) (CARB 2005)

4.1.1.2 Regional Setting

Climate

The NSMRP EIR (CSCC and DFG 2004) provides a summary of the regional air quality setting:

> The San Francisco Bay area, like much of California's central coast, experiences a Mediterranean climate characterized by mild, wet winters and warm summers. Moderated by proximity to the San Francisco Bay system and the ocean, temperatures are seldom below freezing. Summer weather is dominated by sea breezes caused by differential heating between the interior valleys and the coast, while winter weather is dominated by storms from the northern Pacific Ocean that produce nearly all the annual rainfall.
>
> San Pablo Bay typically receives about 90% of its precipitation in the late fall and winter months (November–April); January has the greatest average rainfall. Average annual precipitation ranges from about 20 inches in San Pablo Bay to 40 inches in the upper watersheds of the region's major tributaries (Napa and Sonoma Creek).
>
> Atmospheric conditions such as air temperature gradients, local and regional topography, and winds influence air quality. In the San Francisco Bay Area Air Basin (SFBAAB), of which Napa County is a part, [average] summer maximum temperatures are about 64°F along the coast, and about 88°F farther inland. In winter, average minimum temperatures are in the low to mid-40s along the coast and in the low to mid-30s inland.
>
> Topographical features, the location of the Pacific high pressure system, and varying circulation patterns resulting from temperature gradients affect the speed and direction of local winds. The winds play a major role in the dispersion of pollutants. Strong winds can carry pollutants far from their source; a lack of wind will allow pollutants to concentrate in an

> area. Wind patterns in Napa, Sonoma, and Marin Counties are affected by the Bolinas Ridge along the coast, Big Rock Ridge south of Novato, and the Sonoma Mountains to the north.
>
> [Vertical] air dispersion also affects pollutant concentrations. As altitude increases, air temperature normally decreases. Inversions occur when colder air becomes trapped below warmer air, restricting [the vertical mixing of air]. Pollutants become trapped, which promotes the production of secondary pollutants. Subsidence inversions, which can occur during the summer in the SFBAAB, result from [the subtropical high pressure zones] that cause the local air mass to sink, compress, and become warmer than the air closer to the earth. Pollutants accumulate as this stagnating air mass remains in place for 1 or more days.

Air Quality

The federal and state governments have each established their own ambient air quality standards. The U.S. Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) that specify allowable ambient concentrations for criteria pollutants under the provisions of the Clean Air Act. Primary NAAQS are established at levels necessary, with an adequate margin of safety, to protect the public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Similarly, secondary NAAQS specify the levels of air quality determined appropriate to protect the public welfare from any known or anticipated adverse effects associated with air contaminants. Allowable ambient concentrations are set for ozone (O_3), respirable particular matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). Table 4.1-1 summarizes the NAAQS for these pollutants. The 8-hour O_3 and $PM_{2.5}$ standards listed in the table were promulgated in 1997 but were challenged in the courts. In 2002, the courts upheld these two standards. EPA made final designations for the 8-hour O_3 standards on April 15, 2004 and final designations for the new federal $PM_{2.5}$ standards on December 2004. With the new 8-hour O_3 standard in place, the 1-hour O_3 standard has been revoked for the region. Now EPA and the states are working together to develop air quality plans to achieve compliance with the standards, where needed.

In California, the California Air Resources Board (CARB), which is part of the California Environmental Protection Agency, has promulgated ambient air quality standards for O_3, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, and Pb that are more stringent than U.S. EPA's standards, as shown in Table 4.1-1. In 2002, CARB revised the state annual PM_{10} standard and established an annual $PM_{2.5}$ standard. These standards were formally approved by the Office of Administrative Law on June 7, 2004 and went into effect July 7, 2004. CARB has also developed standards for sulfates and hydrogen sulfide. In April of 2005, CARB approved a new 8-hour average standard for ozone which is expected to go into effect in 2006.

Table 4.1-1
Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	Federal[a]	State
O_3	1-Hour	None[d]	0.09 ppm
	8-Hour	0.08 ppm	0.070 ppm [c]
PM_{10}	24-Hour	150 µg/m^3	50 µg/m^3
	Annual Average	50 µg/m^3	20 µg/m^3
$PM_{2.5}$	24-Hour	65 µg/m^3	None
	Annual Average	15 µg/m^3	12 µg/m^3
CO	1-Hour	35 ppm	20 ppm
	8-Hour	9 ppm	9.0 ppm
	8-Hour (Lake Tahoe)	None	6 ppm
NO_2	1-Hour	None	0.25 ppm
	Annual Average	0.053 ppm	None
Pb	30 days	None	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	None
SO_2	1-Hour	None	0.25 ppm
	3-Hour	0.5 ppm [b]	NA
	24-Hour	0.14 ppm	0.04 ppm
	Annual Average	0.03 ppm	None
Sulfates	24-Hour	None	25 µg/m^3
Hydrogen Sulfide	1-Hour	None	0.03 ppm
Visibility Reducing Particles	8-Hour	None	Extinction coefficient of 0.23 per kilometer
Vinyl Chloride	24-Hour	None	0.01 ppm

Source: CARB ADAM website, www.arb.ca.gov/aqs/aaqs2.pdf

Notes:

[a] Primary NAAQS unless otherwise noted

[b]Secondary NAAQS

[c]Approved by CARB on April 2005 and expected to go into effect in 2006.

[d]1-hour ozone standard revoked June 5, 2005 except for areas that do not yet have an effective date for their 8-hour designations.

Counties and metropolitan areas are classified as being in attainment or nonattainment with respect to federal and state ambient pollutant standards. Allowable ambient concentrations are set for ozone (O_3), respirable particular matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). An area's classification is determined by comparing actual monitored air pollutant concentrations with state and federal standards. More than 200 air monitoring stations are located in California and are part of the State and Local Air Monitoring Network. CARB, local Air Pollution Control Districts or Air Quality Management Districts, private contractors, and the National Park Service operate these stations. Based on pollutant concentrations measured at these stations, the

SFBAAB has been designated as attainment or unclassified for all pollutants except for the federal and state ozone standards and state PM10 standard as listed in Table 4.1-2.

Table 4.1-2
Federal and State Attainment Status for the Bay Area

Pollutant	Federal Attainment Status	State Attainment Status
Ozone	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Attainment	Unclassified
Lead	Attainment	Attainment

Air quality data are available from two monitoring stations in the site vicinity: Napa and Vallejo. Existing air quality conditions for O_3, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are shown on Tables 4.1-3 through 4.1-7.

Unlike other parts of the SFBAAB, no exceedances of the 1-hour or 8-hour average federal air quality standards were recorded for O_3 at the Vallejo and Napa monitoring stations between 2002 and 2004. However, similar to other areas of the SFBAAB, exceedances of the state 1-hour average O_3 standard occurred at both stations. CARB recently adopted a new 8-hour O_3 standard (0.07 parts per million [ppm]), which is expected to go into effect at the end of 2005 or early 2006. The proposed state 8-hour average standard for O_3 has been exceeded at the Napa station.

Tables 4.1-4, 4.1-5, and 4.1-6 show that federal and state CO, NO_2, and SO_2 standards were not exceeded at the monitoring stations between 2002 and 2004. Only the Vallejo station monitors SO_2 concentrations.

The monitoring data for the 24-hour average and annual average PM_{10} ambient concentrations at the Napa and Vallejo stations have remained below the federal PM_{10} standards (see Table 4.1-7). However, the state annual average PM_{10} standard was exceeded in 2002 at both the Napa and Vallejo stations. Exceedances of the state 24-hour average PM_{10} standards have also occurred at both stations.

$PM_{2.5}$ ambient concentrations are monitored at the Vallejo monitoring station. The federal annual average $PM_{2.5}$ standard was not exceeded between 2002 and 2004. In 2002, one exceedance of the federal 24-hour average $PM_{2.5}$ standard was recorded; however, the 24-hour average $PM_{2.5}$ standard is attained when 98 percent of the daily concentrations averaged over 3 years is equal to or less than the standard. Therefore, this single exceedance did not result in a nonattainment designation for the region. The state annual average $PM_{2.5}$ standard was exceeded in 2002 at the Vallejo monitoring station.

Table 4.1-3
Summary of Measured Ozone Ambient Concentrations in the Vicinity of the NPSR Project

Pollutant	Monitoring Station[a]	Average Period	Federal/ State Standard	Year[b]		
				2002	2003	2004
O_3	Napa	Peak 1-hour concentration (ppm)	0.12[d]/0.09	0.12	0.105	0.092
		Days above federal standard		0	0	0
		Days above state standard		1	2	0
		Peak 8-hour concentration (ppm)	0.08/0.07 [c]	0.08	0.08	0.07
		Days above federal standard		0	0	0
		Days above state standard		[c]	[c]	[c]
	Vallejo	Peak 1-hour concentration (ppm)	0.12/0.09	0.109	0.101	0.104
		Days above federal standard		0	0	0
		Days above state standard		1	2	1
		Peak 8-hour concentration (ppm)	0.08/0.07[c]	0.07	0.07	0.07
		Days above federal standard		0	0	0
		Days above state standard		[c]	[c]	[c]

Notes:

[a] Monitoring stations located at 2552 Jefferson Ave., Napa; 303 Tuolumne St., Vallejo. Data obtained from CARB ADAM website accessed May 31, 2005 (http://www.arb.ca.gov/adam/welcome.html).

[b] Highest monitored values.

[c] CARB adopted a new state 8-hour O^3 standard on April 28, 2005; the standard expected to go into effect at the end of 2005 or early 2006.

[d] 1-hour ozone standard revoked June 5, 2005 but historical attainment provided as reference.

Table 4.1-4
Summary of Measured Carbon Monoxide Ambient Concentrations in the Vicinity of the NPSR Project

Pollutant	Monitoring Station[a]	Average Period	Federal/ State Standard	Year[b]		
				2002	2003	2004
CO	Napa	Peak 8-hour concentration (ppm)	9/9.0	2.36	2.49	2.00
		Days above federal standard		0	0	0
		Days above state standard		0	0	0
	Vallejo	Peak 8-hour concentration (ppm)	9/9.0	3.85	2.89	3.39
		Days above federal standard		0	0	0
		Days above state standard		0	0	0

Notes:

[a] Monitoring stations located at 2552 Jefferson Ave., Napa; 303 Tuolumne St., Vallejo. Data obtained from CARB's ADAM website accessed May 31, 2005 (http://www.arb.ca.gov/adam/welcome.html).

[b] Highest monitored values.

Table 4.1-5
Summary of Measured Nitrogen Dioxide Ambient Concentrations in the Vicinity of the NPSR Project

Pollutant	Monitoring Station[a]	Average Period	Federal/ State Standard	Year[b]		
				2002	2003	2004
NO_2	Napa	Peak 1-hour concentration (ppm)	None/0.25	0.052	0.066	0.056
		Days above federal standard		NA	NA	NA
		Days above state standard		0	0	0
		Annual Average concentration (ppm)	0.053/None	0.013	0.012	0.011
	Vallejo	Peak 1-hour concentration (ppm)	None/0.25	0.051	0.067	0.049
		Days above federal standard		NA	NA	NA
		Days above state standard		0	0	0
		Annual Average concentration (ppm)	0.053/None	0.013	0.012	0.012

[a] Monitoring stations located at 2552 Jefferson Ave., Napa; 303 Tuolumne St., Vallejo. Data obtained from CARB's ADAM website accessed May 31, 2005 (http://www.arb.ca.gov/adam/welcome.html).

[b] Highest monitored values

NA=not applicable.

Table 4.1-6
Summary of Measured Sulfur Dioxide Ambient Concentrations in the Vicinity of the NPSR Project

Pollutant	Monitoring Station[a]	Average Period	Federal/ State Standard	Year[b]		
				2002	2003	2004
SO_2	Vallejo	Annual Average concentration (ppm)	0.030/None	0.001	0.001	0.001
		Peak 24-hour concentration (ppm)	0.14/0.04	0.004	0.003	0.005
		Days above federal standard		0	0	0
		Days above state standard		0	0	0

[a] Monitoring stations located at 303 Tuolumne St., Vallejo. Other two stations (2552 Jefferson Ave., Napa and 837 5th St., Santa Rosa) do not monitor SO_2 concentrations. Data obtained from CARB's ADAM website accessed May 31, 2005 (http://www.arb.ca.gov/adam/welcome.html).

[b] Highest monitored values.

Table 4.1-7
Summary of Measured Respirable Particulate Matter Ambient Concentrations in the Vicinity of the NPSR Project

Pollutant	Monitoring Station[a]	Average Period[b]	Federal/ State Standard	Year[c]		
				2002	2003	2004
PM_{10}	Napa	Annual Average concentration ($\mu g/m^3$)	50/20	25.4/ 26.4	20.6/ NA	22/ NA
		Peak 24-hour concentration ($\mu g/m^3$)	150/50	66.9/ 69.9	40.6/ 30.8	59.2/ NAv
		Days above federal standard		0	0	0
		Days above state standard		4	0	NAv
	Vallejo	Annual Average concentration ($\mu g/m^3$)	50/20	21.4/ 22.2	16.8/ 17.3	18.9/ 19.6
		Peak 24-hour concentration ($\mu g/m^3$)	150/50	79.8/ 83.5	38.2/ 39.0	50.8/ 51.4
		Days above federal standard		0	0	0
		Days above state standard		2	0	1

[a] Monitoring stations located at 2552 Jefferson Ave., Napa; 303 Tuolumne St., Vallejo. Data obtained from CARB's ADAM website accessed May 31, 2005 (http://www.arb.ca.gov/adam/welcome.html). (http://www.arb.ca.gov/adam/welcome.html).

[b] µg/m3 = micrograms per cubic meter.

[c] Highest monitored values

NAv=data not available. Federal/State measurements provided. Differences may occur due to use of different methods.

Table 4.1-8
Summary of Measured Fine Particulate Matter Ambient Concentrations in the Vicinity of the NPSR Project

Pollutant	Monitoring Station[a]	Average Period	Federal/ State Standard	Year[b]		
				2002	2003	2004
$PM_{2.5}$	Vallejo	Annual Average concentration ($\mu g/m^3$)	15/12	13.6	9.4	11.1
		Peak 24-hour concentration ($\mu g/m^3$)	65/None	72.3	30.8	39.7
		Days above federal standard		1	0	0
		Days above state standard		0	0	0

[a] Monitoring station located at 303 Tuolumne St., Vallejo. Napa station (2552 Jefferson Ave., Napa) does not monitor PM2.5 concentrations. Data obtained from CARB's ADAM website accessed May 31, 2005 (http://www.arb.ca.gov/adam/welcome.html).

[b] 1st Highest monitored values

4.1.1.3 Project Setting

Cargill is currently conducting salt-processing activities at the NPSR project site as part of the phase-out agreement with DFG. This activity includes monitoring pond conditions, managing water control structures, pumping water, harvesting, and shipping salt. These activities generate

air emissions, primarily associated with harvest equipment, as well as transportation (by pickup truck or small boat) around the proposed project area. The only other current sources of emissions is limited recreational traffic (i.e., personal vehicle traffic and small boat traffic) and tugs towing the salt barges.

Relatively few sensitive receptors (i.e., land uses that are particularly sensitive to air pollutant emissions such as residential development, schools, hospitals, child care centers, etc.) are located in close proximity to the site. The Milton Road community is a rural residential development on the west bank of the Napa River and a few residences are located along Green Island Road. Also Napa County airport, some commercial development, a vineyard, the American Canyon wastewater treatment plant, and a closed landfill are in close proximity to the site.

4.1.2 Impacts and Mitigation Measures

This section identifies and discusses the environmental impacts resulting from the proposed project, and suggests mitigation measures to reduce the levels of impact.

4.1.2.1 Methodology and Significance Criteria

The analysis follows the approach recommended in the Bay Area Air Quality Management District's CEQA Guidelines (BAAQMD 1999) to determine potential impacts on air quality. The air quality impacts of the proposed project are considered significant if the proposed project would:

- Substantially contribute to an existing or projected air quality standard violations
- Exceed the thresholds that BAAQMD defines as significant under CEQA for project operation activities: total emissions greater than 80 pounds per day or 15 tons per year of reactive organic compounds (ROGs), NO_X, and PM_{10} (BAAQMD 1999)
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affecting a substantial number of people, or
- Conflict with or obstruct implementation of applicable air quality plans or local community plans

The primary concern for this proposed project would be the potential impacts from construction activities. According to the BAAQMD CEQA Guidelines, fugitive dust emissions (PM_{10}) from construction activities are considered less than significant if mitigation measures appropriate for the magnitude of a proposed project are applied. Exhaust emissions of CO and O_3 precursors (ROGs and NO_X) during construction are considered less than significant because these emissions are included in the emission inventory that is used in the regional air quality plans. Therefore, such emission would not be expected to interfere with the attainment and maintenance of the CO and O_3 ambient air quality standards. The construction impact discussion below focuses on the appropriate mitigation measures to determine if impacts are significant.

Operational impacts are based on the expected emissions of criteria pollutants, toxics, and odors and consistency with the air quality plans. The proposed project would not result in new sources that would generate significant toxic emissions.

In addition, severity of odor impacts depends on numerous factors including the nature, frequency, and intensity of the source; wind speed and direction; and sensitivity of the receptor. In general, odors are generated from sources that include wastewater treatment plants, composting facilities, chemical plants, and other similar facilities. Near the proposed project, winds tend to blow from the west, minimizing the transport of any odors to the rural residential development on the west bank of Napa River. Although, a few residences live on the east side of the proposed project. Under properly managed conditions, the proposed project is not expected to create objectionable odors affecting a substantial number of people. Proper management of the pond would control odors. Pond management is discussed in Section 4.7 (Water and Sediment Quality).

Also, the proposed project is expected to be consistent with the air quality plans as long as other impacts are not significant. Therefore, the operational impact discussion below focuses on potential criteria pollutant emissions.

4.1.2.2 Impacts and Mitigation Measures

PROJECT – TIDAL RESTORATION AND MANAGED PONDS

AQ-1: Construction-related impacts to air quality	Construction activities would directly emit both fugitive dust (PM_{10}) from ground disturbance and exhaust pollutants (NO_X, CO, PM_{10}, SO_2, and ROGs) from construction equipment.
Significance:	Potentially significant
Mitigation AQ-1:	Apply the following mitigation measures to reduce fugitive dust and equipment exhaust emissions: • Water all active construction areas at least twice daily, if needed. • Cover all trucks traveling off site that are hauling soil, sand, and other loose materials or require all such trucks to maintain at least 2 feet of freeboard. • Pave, apply water 3 times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites, if needed. • Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites, if needed. • Sweep streets daily (with water sweepers) if visible

soil material is carried onto adjacent public streets.

- Enclose, cover, water twice daily or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.), if needed.
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion-control measures to prevent silt runoff to public roadways.
- Minimize the time equipment is idling.
- Maintain properly tuned equipment.

Residual Significance: Less than significant

Impact Analysis Discussion: Construction activities for the proposed project would include breaching existing external levees, improving levees, excavation of tidal channels, installing water control structures, grading internal levees and habitat features, and adding fill material. These activities would be performed over two construction seasons and would likely require the use of excavators, haul trucks, dozers, scrapers, compactors, and barges. Most of the material excavated would be used for on-site improvements. Some material not appropriate for on-site improvements may be recycled or disposed of off-site. All fill material, except road base and gravel for trails, is expected to come from on-site sources or from routine dredging of the Napa River.

These construction activities would generate fugitive dust (PM_{10}) and emit exhaust pollutants (NO_X, CO, PM_{10}, SO_2, and ROGs) from gasoline- and diesel-fueled construction equipment. Off-site impacts from these criteria pollutant emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather. These emissions may impact the relatively few nearby sensitive receptors that consist primarily of rural residential areas located to the west, on the opposite side of the Napa River.

The BAAQMD CEQA Guidelines do not provide a numerical threshold of significance for these emissions, nor is quantification of such emissions required. They focus on the application of appropriate mitigation measures to minimize construction impacts. Without any mitigation measures, the short-term construction activities would be considered significant. However, Mitigation Measure AQ-1 identified above includes a number of feasible control measures that can be implemented to significantly reduce fugitive dust emissions from ground-disturbing activities and minimize exhaust pollutants from construction equipment. With the implementation of Mitigation Measure AQ-1, short-term construction impacts are anticipated to be less than significant.

AQ-2: Air quality impacts related to recreational use Increased emissions from vehicles and equipment from recreational users.

Significance: Less than significant

Mitigation: No mitigation required

Impact Analysis Discussion: The improvements to the site would include a new water line and new water control structures. The associated equipment would not directly generate emissions. However, the proposed project would provide facilities for recreational users. For example, staging areas would be provided for parking, picnicking, restrooms, and a boat launch. Also, new trails would be created for pedestrians and cyclists and limited hunting may be allowed. These facilities may indirectly increase emissions from the use of vehicles and other equipment (e.g., boats). It is anticipated that the proposed project site would receive 30 to 40 visitors per day during the week and 75 to 100 per day on the weekends. This additional number of recreational users is small and the resulting emissions increase would be less than significant.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Air quality impacts for Alternative 1 are essentially equivalent to the proposed project. Mitigation measures would be the same as for the proposed project.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Air quality impacts for Alternative 2 are essentially equivalent to the proposed project. Mitigation measures would be the same as for the proposed project.

ALTERNATIVE 3 – NO PROJECT

The only emissions associated with the No Project Alternative would be from vehicles and equipment used for levee repair and for staff access to the site. No mitigation measures are implemented for the No Project Alternative.

4.2 BIOLOGICAL RESOURCES

4.2.1 Regional Setting

The San Francisco Bay-Delta estuary is a vibrant, dynamic ecosystem that provides critical habitat for diverse flora and fauna. Over the past 150 years, modification of the estuary and development and land use practices in its watersheds have taken a severe toll on the tidal habitats of the estuary. In 2005, only 10 to 15 percent of the historic bay wetlands remain intact (Goals Project 1999; USFWS 2005). As a result, some species endemic to estuarine wetlands are now considered rare, threatened, or endangered, including the California clapper rail, the California black rail, and the salt marsh harvest mouse.

The project site is situated in the North Bay region of the estuary. Between the mid-1800s and 1930s, as much as 28,000 acres of tidal baylands in the North Bay were converted to agriculture (Goals Project 1999). Large-scale commercial salt production began in 1952, when Leslie Salt, already well established in the South Bay, purchased 11,000 acres of diked agricultural lands and islands (formerly tidal wetlands) in the North Bay. Despite these large-scale disturbances, the wetlands of the North Bay continue to support a broad range of wildlife species, including birds, mammals, reptiles, amphibians, fish, and invertebrates. Many species of waterfowl and shorebirds use the open water habitats provided by the North Bay salt ponds.

Many small creeks are tributaries to the Napa River south of the City of Napa. These creeks drain agricultural, urban, and commercially developed lands in addition to the 11,000 acres of active and inactive salt ponds. The Napa River estuary (the confluence of fluvial freshwater outflow from the river and its tributaries and saltwater from daily tides) provides habitats for a large diversity of animals and plants. The wildlife these habitats support varies with tide, freshwater inflow, and season, and this dynamism adds to the biodiversity of the region. Examples of natural habitats in the lower Napa River watershed include tidal marsh, freshwater marsh, seasonal wetland, vernal pools and swales, riparian forest, diked marsh, and coast live oak woodlands. Disturbed habitats include developed uplands, salt ponds, ruderal grasslands and thickets, and vineyards. A regional scale habitat map is shown in Figure 1-1.

4.2.2 Project Setting

4.2.2.1 Information Sources

Existing biological resources in the vicinity of the project area include terrestrial and aquatic flora and fauna. The biological resources in the project area are described in the context of their habitat types. In general, the habitat typology used in this report is similar to the conventions used in the Baylands Ecosystem Habitat Goals Report (Goals Project 1999) and the NSMRP EIR (CSCC and CDFG 2004). The habitat descriptions provided in this section are based on a field visit conducted in May 2005, conversations and data provided by DFG (Huffman, pers. comm., 2005) and Cargill (Ransom and Paredes, pers. comm., 2005), and other regional information sources including:

- NSMRP Environmental Impact Report (CSCC and CDFG 2004)
- Baylands Ecosystem Habitat Goals Report (Goals Project 1999)

- South Bay Salt Pond Restoration: Feasibility Analysis (Siegel and Bachand 2002)
- Napa River Fisheries Monitoring Program (NRFMP 2004)

4.2.2.2 Habitats

Habitats of the project area include mudflat, tidal channels (described in Section 4.2.4.2), tidal marsh, seasonal wetland, salt pond, levee, and upland. These habitat types, their associated vegetation communities, and their wildlife uses are described below. Acreages of these habitats are provided in Table 2-1. Special-status plant and wildlife species that occur in the vicinity of the project are discussed in Section 4.2.3. Fish and other aquatic resources are described in Section 4.2.4

Mudflat

Intertidal mudflat (approximately 190 acres) exists immediately south and west of the project area in the intertidal zone between the salt pond's levees and the subtidal channel of the Napa River (Figure 2-1). A relatively small area of tidal mudflat exists within the project area in the barge channel at elevations between MLLW and MSL. Mudflat, by definition, is devoid of macrophytic vegetation. Intertidal mudflat and shallow water biota includes algae, invertebrates and small fish. Tidal mudflat habitat is utilized by numerous shorebird species for foraging at low tide and by the fish community at high tide. When the mudflats are flooded by the tide, shorebirds seek refuge in wetland habitats adjacent to the mudflats.

Tidal Marsh

Prior to 1850, the vast majority of the project area was tidal marsh habitat. Currently, Napa River levees isolate much the project area from tidal inundation. The distribution of tidal marsh on the project site is limited to the barge channel, and the outboard side of river front levees (Figure 2-1). Tidal marsh occurs adjacent to and in the vicinity of the NPSR project in Fagan Marsh, Bull Island, Coon Island, Pond 2A, along slough and river edges and is developing in Pond 3 of the NSMRP (Figure 1-1). Fagan Marsh, directly north of Ponds 9 and 10, is a remnant historic tidal marsh. DFG manages this marsh and the 110-acre Bull Island as the Fagan Marsh Ecological Reserve. Fagan Marsh is known to support populations of special-status plants and wildlife (see Section 4.2.3). The remaining adjacent parcels are owned by Napa Sanitation District, Napa County, and a private owner (URSGWC 2000).

Vegetation. Vegetation species observed in tidal marsh habitat in and adjacent to the project area are listed in Table 4.2-1. Tall emergent vegetation species such as bulrushes (*Scirpus acutus,* S. *californicus,* S. *robustus*) and narrow-leaved cattail (*Typha angustifolia*) dominate these brackish tidal wetlands. Small patches of Pacific cordgrass (*Spartina foliosa*) grow along the edges of the mudflat outboard of levees along CB1 and CB7, and in the barge channel south of Pond W1. Mid- and high-marsh species such as pickleweed (*Salicornia virginica*), saltgrass (*Distichlis spicata*) and fat hen (*Atriplex triangularis*) exist on the steep transitions between tidal marsh and levee habitat.

Wildlife. Wildlife abundance is limited by the spatial extent and patch size of tidal marsh habitat. Shorebirds, waterfowl and passerine avian species may forage and breed in tidal marsh habitat within the project area. Marsh wren (*Cistothorus palustris*) nests were observed in the

outboard tidal wetland adjacent to CB1 and CB7. Wildlife species commonly associated with the tidal marsh habitat in the project area include great blue heron (*Ardea herodias*), great egret (*Ardea alba)*, American coot (*Fulica americana*), killdeer (*Charadrius vociferus)*, northern harrier (*Circus cyaneus)*, San Francisco common yellowthroat (*Geothlypis trichas sinuosa*), and San Pablo song sparrow. Other species that probably use the marshes include raccoon (*Procyon lotor)*, mallard (*Anas platyrhynchos)*, sora (*Porzana carolina*), Virginia rail (*Rallus limicola*), and willet (*Catoptrophorus semipalmatus)* (CSCC and CDFG 2004; Evens, pers. comm., 2005).

Adjacent tidal marsh habitat at Fagan Marsh is known to support one of the highest densities of threatened California black rails in the estuary (Evens et al. 1989, 1991). Proximate habitat at Coon Island is a Napa River population center for endangered California clapper rails (Evens, pers. comm., 2005) and the surrounding marsh transition zones support high densities of the endemic San Francisco common yellowthroat, a "Priority 1" California bird species of special concern (Evens, in press). The presence of all of these tidal marsh-dependent species in the immediate vicinity of the project site may supply source populations for salt pond restoration efforts.

Seasonal Wetland

Seasonal wetlands are vegetated or partially vegetated areas that are saturated or inundated during portions of the wet season. They typically form in shallow depressions and other areas with poor drainage. Seasonal wetlands occur within the project area along the railroad corridor where adjacent swales and drainage ditches were created to aid in controlling storm water runoff; in the drainage channel east of Ponds B-1, B-2 and B-3; and in diked historic tide lands (i.e., diked marsh) that have not been drastically disturbed by salt-making activities (Figure 2-1).

Vegetation. Two vegetation communities comprise the majority of the seasonal wetland habitat: a pickleweed dominated community and an ecotone (upland transition) community. The distribution of these communities is a function of elevation and drainage. The pickleweed community exists in topographic depressions and along channels that are inundated or ponded during the wet season. Plant species observed in this community in addition to pickleweed include brass buttons (*Cotula coronopifolia*), alkali heath (*Frankenia salina*), and salt grass.

As elevation increases, the pickleweed community intergrades to the ecotone community. The ecotone community is comprised primarily of nonnative mesic grasses and forbs (Table 4.2-1). Native species present in this community include creeping wild rye (*Leymus triticoides*) and coyote brush (*Baccharis pilularis consanguinea)*.

In addition to the pickleweed and ecotone communities, a small area of tall emergent vegetation (e.g., *Typha* spp., *Scripus* spp.) exists in the seasonal wetland east of Pond B-2 (Figure 2-1). This wetland appears to be in a transitional state. In May 2005 some of the tall emergent vegetation was decadent and tree snags were scattered throughout the wetland suggesting that this area was drier or well drained in the past, then experienced a period of sustained flooding causing the trees to die and the tall emergent species to proliferate. Currently, the decline of emergent vegetation suggests that this area is again drier. It is possible that the hydrology of this area is associated with the City of American Canyon wastewater treatment plant operations (upslope of the wetland), or seepage from the salt ponds. Cargill recently "keyed" (i.e., placed of a clay core in the center of the levee) the salt pond levee in this area to reduce seepage to the adjacent Green Island Vineyard (Ransom and Paredes, pers. comm., 2005)

Table 4.2-1
Plant Species Observed in the Project Area

Scientific Name	Common Name	Native/ Nonnative	Wetland Indicator Status	Tidal Marsh	Seasonal Wetland (Ecotone)	Seasonal Wetland (Pickleweed dominant)	Ruderal	Levee
Agrostis avenacea	hairy flower bentgrass	nonnative	FACW*		x			
Anagallis arvensis	scarlet pimpernel	nonnative	FAC					x
Artemisia douglasiana	California mugwort	native	FACW				x	
Atriplex semibaccata	Australian salt bush	nonnative	FAC					x
Atriplex triangularis	fat hen	native	FACW	x				
Avena sp.	oat grass	nonnative	NL				x	
Baccharis douglasii	marsh baccharis	native	OBL	x				
Baccharis pilularis	coyote brush	native	NL		x			
Brodiaea sp.	brodiaea	native	OBL to FACU					x
Bromus diandrus	ripgut brome	nonnative	NL					x
Bromus hordeaceus	soft chess	nonnative	FACU-		x		x	x
Carduus pycnocephalus	Italian thistle	nonnative	NL				x	
Carpobrotus sp.	ice plant	nonnative	NL				x	D
Centaurea solstitialis	yellow star-thistle	nonnative						x
Convolvulus arvensis	bindweed	nonnative	NL					x
Cotula coronopifolia	brass-buttons	nonnative	FACW+			x		x
Cynosurus echinatus	hedgehog dogtil-grass	nonnative	NL					x
Distichlis spicata	saltgrass	native	FACW	x		x		
Epilobium brachycarpum	annual fireweed	native	UPL					x
Eschscholzia californica	California poppy	native	NL					x
Foeniculum vulgare	sweet fennel	nonnative	FACU				x	
Frankenia salina	alkali heath	native	FACW+			x		x
Grindelia stricta var. angustifolia	marsh gum plant	native	FACW	x				
Hemizonia pungens	common tarweed	native	FAC					
Hirschfeldia incana	short pod mustard	nonnative	NL				x	
Hordeum marinum ssp. gussoneanum	Mediterranean barley	nonnative	FAC		x		x	x
Hypochaeris glabra	smooth cat's ear	nonnative	NL					x
Jaumea carnosa	jaumea	native	OBL	x				
Juncus balticus	baltic rush	native	OBL	x				
Lactuca serriola	prickly lettuce	nonnative	FAC		x			
Lepidium latifolium	peppergrass	nonnative	FACW	x	x	x	x	x
Leymus triticoides	creeping wild-rye	native	FAC+		x			
Lilaeopsis masonii	Mason's lilaeopsis	native	OBL	x				
Lolium sp.	ryegrass	nonnative	NL					x
Lotus corniculatus	bird's foot trefoil	nonnative	FAC					x

Table 4.2-1 (continued)
Plant Species Observed in the Project Area

Scientific Name	Common Name	Native/ Nonnative	Wetland Indicator Status	Tidal Marsh	Seasonal Wetland (Ecotone)	Seasonal Wetland (Pickleweed dominant)	Ruderal	Levee
Mesenbranthemum nodiflorum	slender-leaved ice plant	nonnative	FAC					x
Nicotiana glauca	tree tobacco	nonnative	FAC					x
Phalaris sp	canarygrass	native or nonnative	OBL to FACU				x	x
Picris echioides	bristly ox-tongue	nonnative	FAC*				x	
Plantago lanceolata	English plantain	nonnative	FAC-					x
Polypogon monspeliensis	rabbitsfoot grass	nonnative	FACW+		x			x
Raphanus sativus	wild radish	nonnative	NL		x		x	x
Rumex crispus	curly dock	nonnative	FACW-		x	x	x	
Rumex pulcher	fiddle dock	nonnaitve	FAC+					x
Salicornia virginica	pickleweed	native	OBL			D		x
Scirpus acutus	hard-stem bulrush	native	OBL	x				
Scirpus americanus	three-square	native	OBL	x				
Scirpus californicus	California bulrush	native	OBL	x				
Scirpus robustus	alkali bulrush	native	OBL	x		x		
Sonchus oleraceus	common sow-thistle	nonnative	NI*				x	
Spartina foliosa	cord grass	native	OBL	x				
Spergulariasp.	sand-spurrey	nonnative or native	OBL-FACU					x
Tetragonia tetragonioides	New Zealand spinach	nonnative	NL					x
Triglochin martima	seaside arrow grass	native	OBL	x				
Typha angustifolia	narrow-leaved cattail	native	OBL	x				
Typha latifolia	broad-leaved cattail	native	OBL					
Veronica anagallis-aquatica	water speedwell	nonnative	OBL					
Vicia sp.	vetch	nonnative	NL					x
Vulpia myuros	rattail fescue	nonnative	FACU*					x

D = Dominant, X= present
Wetland Indicator Status (USACE 1989)
OBL (obligate wetland plants have an estimated probability >99 percent to occur in wetlands)
FACW (facultative wetland plants have an estimated probability of 67-99 percent to occur in wetlands)
FAC (facultative plants have an estimated probability of 34-66 percent to occur in wetlands)
FACU (facultative upland plants have an estimated probability of 1-33 percent to occur in wetlands)
NI (no indicator; insufficient information to determine a status)
NL (not listed; assumed to be an upland species)
UPL (upland plants that have an estimated probability of <1 percent of occurring in wetlands)
* Indicates a tentative status assignment
+ Indicates a greater tendency to occur in wetlands
- Indicates a lesser tendency to occur in wetlands

Wildlife. As with tidal marsh habitat, wildlife abundance in seasonal wetland habitat is limited by the spatial extent and patch size. Bird activity in this habitat type is typically concentrated in the seasonally ponded depressions. These ponds may support invertebrates including corixids and ostracods. Common avian species using portions of this habitat include killdeer (*Charadrius vociferous*) and long-legged waders such as black neck stilts (*Himantopus mexicanus*), greater yellowlegs (*Tringa melanoleuca*) and great and snowy egrets (*Ardea alba* and *Egretta thula,* respectively); mammals may include California vole (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), and black-tailed deer (*Odocoileus hemionus*) (Goals Project 1999). Black-tailed jackrabbit (*Lepus californicus*) were observed in this habitat during a May 2005 site visit. Pickleweed and other marsh plants may provide habitat for the salt marsh harvest mouse (see Section 4.2.3, Special-Status Plants and Wildlife) although the habitat is narrow and linear in most locations.

Salt Ponds

Salt ponds are the most extensive habitat type in the project area, comprising a total of 1,142 acres (Figure 2-1, Table 2-1). Salt pond ecology is primarily a function of salinity and hydrology. During salt production activities (1952 to 1991) salt ponds in the project area were used as pickle ponds, crystallizers and wash ponds (see Section 2.1.1, Salt Production Operations). Pickle ponds had brine with salinity concentrations ranging from 140 to 312 ppt (Siegel and Bachand 2001). Highly concentrated brine solution (approximately 300 ppt) was delivered by gravity feed from the pickle ponds to Crystallizer Beds (CBs) 1 through 9 in series. Crystallizer beds were managed in an optimal salinity range (356 to 369 ppt) to promote precipitation of sodium chloride. During salt harvesting (August through November) the crystallizer beds were dry. Since 2003 when DFG purchased the Napa Plant Site, ponds have been managed to reduce residual salinity concentration. Subsequently, pond ecology at the plant site is in a state of flux, though water salinity concentrations remain high for most of the year (Figure 4-1).

Vegetation. The vascular plant community associated with the salt pond habitat is confined to pond margins, islets, and internal levees within the pond complex. The most common plants observed on these terrestrial features were iceplant (*Carpobrotus* sp.) and slender-leaved iceplant (*Mesenbranthemum nodiflorum*) (Table 4.2-1, levees).

Wildlife. The high salinity concentrations in the ponds limit the habitat value for most terrestrial and aquatic organisms. USGS has conducted salt pond avian surveys at the Napa Plant Site since April 2003. Data from 18 survey events between April 2003 and February 2005 were made available to the project team (USGS 2005) and are provided in Appendix C. Table 4.2-2 shows a list of bird species observed and the total number of individuals recorded during 18 census events conducted during this period. A total of 24 species and 2,205 individuals were recorded with western sandpipers (*Calidris mauri*), gulls (*Larus* sp.) and dunlin (*Calidris alpina*) being the most abundant species observed at the site. Small shorebirds including plovers, sandpipers (*Calidris* spp.*)* and dunlin accounted for approximately 70 percent of the bird observations (Table 4.2-2).

Table 4.2-3 shows bird abundance by pond. Pond B-3 had the highest bird use, accounting for nearly half of all birds observed during the surveys. Ninety-five percent of the bird observations in Pond B-3 were recorded during three census events between October and November 2004.

Salinity data provided by Cargill (Figure 4-1) indicates that water salinity was high (greater than 100 ppt) in September, and Pond B-3 was dry for most of October and November. Data presented in Table 4.2-3 does not suggest a strong correlation between pond type (e.g., pickle pond or crystallizer bed) and bird abundance, but no statistical analyses have been conducted to test this relationship.

Overall, bird diversity and abundance in the salt ponds of the plant site is low because the high salinity ponds lack significant prey resources. Waterfowl were not observed at the site, with the exception of 2 mallards recorded in CB1 in April 2003 (Appendix C). In contrast, low salinity evaporator ponds on the west side of the river have high species abundance and diversity. For example, over 30,000 birds representing 31 species (predominately shorebirds and waterfowl) were recorded in Pond 4 during a single census event in February 2005 (USGS 2005).

Table 4.2-2
Bird Species Observed at the Napa Plant Site Salt Ponds Between April 2003 and February 2005 (USGS 2005)

Common Name	Scientific Name	Number of Birds Observed (Sum of 18 Census Events)
American avocet	*Recurvirostra americana*	67
black-bellied plover	*Pluvialis squatarola*	176
black-necked stilt	*Himantopus mexicanus*	11
California gull	*Larus californicus*	15
dowitcher sp.	*Limnodromus sp.*	27
dunlin	*Calidris alpina*	311
great blue heron	*Ardea herodias*	4
great egret	*Ardea alba*	1
greater yellowlegs	*Tringa melanoleuca*	52
gull	*Larus sp.*	385
horned lark	*Eremophila alpestris*	3
killdeer	*Charadrius vociferus*	5
long-billed curlew	*Numenius americanus*	4
least sandpiper	*Calidris minutilla*	177
mallard	*Anas platyrhynchos*	2
northern harrier	*Circus cyaneus*	1
ringed-billed gull	*Larus delawarensis*	75
red-tailed hawk	*Buteo jamaicensis*	1
semi-palmated plover	*Charadrius semipalmatus*	118
western snowy plover	*Charadrius alexandrinus nivosus*	2
stilt sandpiper	*Calidris himantipus*	1
turkey vulture	*Cathartes aura*	3
western sandpiper	*Calidris mauri*	624
willet	*Catoptrophorus semipalmatus*	140
Total		**2,205**

Table 4.2-3
Bird Abundance by Pond Observed at the Napa Plant Site Between April 2003 and February 2005 (USGS 2005)

Pond	Number of Birds Observed (Sum of 18 Census Events)
9	1
10	269
CB1	211
CB2	95
CB3	315
CB4	0
CB5	32
CB6	4
CB7	122
CB8	55
CB9	26
B-1	0
B-2	33
B-3	1010
Unit 3	32
Total	**2,205**

Levees

An extensive network of levees exists throughout the project area, covering over 150 acres. The habitat values associated with the levees varies with location and plant cover. The largest levees are located on the perimeter of the project area. Smaller internal levees form the boundaries between the salt ponds.

Vegetation. The lower elevational band on the levees support vegetation species commonly found in the tidal marsh community including alkali heath and brass-buttons. Topographically higher portions of the levees are characterized by iceplant and an upland ruderal herbaceous community including species such as sweet fennel (*Foeniculum vulgare).* The highly invasive nonnative plants pepperweed (*Lepidium latifolium*) and yellow star-thistle (*Centaurea solstitialis*) have also colonized some levees in the project area. Some levees have no vegetation and vegetation is mowed in some locations.

Wildlife. Although levees are considered a disturbed habitat, they do provide some wildlife value. The large and intermediate size levees provide habitat for California ground squirrel, black-tailed jackrabbit, gopher snake (*Pituophis melanoleucus*), western fence lizard (*Sceloporus occidentalis*) and songbirds. The internal levees of the salt ponds are potential nesting habitat for terns (*Sterna* spp.) and American avocet (*Recurvirostra americana*). Levees can also used as access corridors by nonnative predators such as dogs (*Canis familiaris*), cats (*Felis catus*) and

red fox (*Vulpes vulpes*); and native predators including striped skunks (*Mephitis mephitis*) and raccoons (*Procyon lotor*).

Uplands

Uplands in the project area include the salt production facilities, Green Island and other areas of disturbed ground and fill. These areas comprise approximately 42 acres of the project site.

Vegetation. A ruderal community and an ornamental community characterize vegetation in the upland areas. The ruderal herbaceous community persists in disturbed areas that are neither paved nor maintained. Invasive, nonnative plants including sweet fennel, wild radish (*Raphanus sativa*) and bristly ox tongue (*Picris echioides*) dominate these areas. Pepperweed is also present. The ornamental community occurs in the landscaped areas of Green Island and includes nonnative tree species such as palms and eucalyptus (species not identified).

Wildlife. Wildlife use in the ruderal herbaceous community is similar to that of the levee tops. Red-winged blackbird (*Agelaius phoeniceus*) and white-crowned sparrow (*Zonotrichia leucophrys*) were observed foraging in these areas during the May 2005 site visit. Upland areas provide resources for a variety of domesticated predators. Human-made structures such as pump houses and salt plant buildings may provide habitat for barn owl (*Tyto alba*), swallows, and roosting bats.

4.2.3 Special-Status Plants and Wildlife

Special-status species (or listed species) are those that have been identified as rare, threatened or endangered by state (DFG) and federal (USFWS) regulatory agencies or nongovernmental entities (e.g., California Native Plant Society). Species with potential to occur in the project vicinity were identified from the following sources:

- The DFG's Natural Diversity Database (CNDDB) records within the following nine USGS 7.5-minute quadrangles that include the project area and vicinity: Cuttings Wharf, Sears Point, Sonoma, Napa, Mount George, Cordelia, Benicia, Mare Island, and Petaluma Point (CNDDB 2005).
- Species lists for those same nine USGS 7.5-minute quadrangles from the USFWS Sacramento Field Office website were also obtained.

In addition, any species identified in the NSMRP EIR not included in the above queries were included on the list of species with potential to occur in the project vicinity. Species were evaluated as having potential to occur, not likely to occur, or no potential to occur in the project area based on habitat descriptions, the known distribution or range of the species, and any known nearby occurrences of the species. Special-status species that are known to be present within the project area are also identified.

Tables 4.2-4 and 4.2-5 list the special-status plant and wildlife species with potential to occur in the vicinity of the project area. Species that do not have the potential to occur in the project area because of lack of suitable habitat, species range, or other considerations are not addressed further in this report.

4.2.3.1 Special-Status Plant Species

No threatened or endangered plant species are known to occur on the project site. Special status species plants with the potential to occur in the project vicinity which were not identified onsite are listed below and shown in Table 4.2-4.

- Suisun marsh aster
- Alkali milk-vetch
- San Joaquin spearscale
- Salt marsh owl's clover
- Congdon's tarplant
- Pappose tarplant
- Dwarf downingia
- Delta tule-pea
- Soft bird's-beak
- Marin knotweed
- Pacific cordgrass
- Water sack clover

On November 4, 2005, a reconnaissance-level botanical survey was conducted in the potential breach locations in the North and Central Units. Future botanical surveys will be conducted during targeted blooming periods in areas to be disturbed by construction. During the November survey no listed plant species were observed in the potential breach locations. However, a population of Mason's lilaeopsis (*Lilaeopsis masonii*) was observed on the east bank of the Napa River, just north of the barge channel. No other species listed in Table 4.2-4 have been documented to occur in the project area. Known occurrences of special-status plants in close proximity (within a mile) to the project area include populations of soft bird's-beak between Fagan and Steamboat Sloughs; Suisun Marsh aster in Fagan Marsh; Delta tule-pea between Fagan Marsh and the Napa County Airport, and on Edgerly and Coon Islands; Mason's lilaeopsis on the project site; Marin knotweed in Fagan Marsh; and Pacific cordgrass on Coon Island (Figure 4-2) (CNDDB 2005; Wyckoff, pers. comm., 2005).

Table 4.2-4
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Federal and State threatened and endangered species				
Blennosperma bakeri	Baker's stickyseed (=Sonoma Sunshine)	E/E/1B	Valley and foothill grassland (mesic), vernal pools, blooms Mar-May, 10 - 110 m.	Not likely to occur. No typical grassland vernal pool habitat in the project area. The nearest occurrence is 8.1 mi W of the project area.
Castilleja affinis spp. *Neglecta*	Tiburon Indian paintbrush	E/T/1B	Valley and foothill grassland (serpentinite), blooms Apr-Jun, 60 - 400 m.	Not likely to occur. Lack of serpentine grassland in the project area. The nearest occurrence is 2.9 mi E of the project area.
Chorizanthe valida	Sonoma spineflower	E/E/1B	Sandy coastal prairie, 10 - 305 m, blooms Jun-Aug.	Not likely to occur. Only one known population in Point Reyes National Seashore, Marin County.
Cordylanthus mollis ssp. *mollis*	Soft bird's-beak	E/R/1B	Marshes and swamps (coastal salt), blooms Jul-Aug, 0 - 3 m.	Not likely to occur. The project area contains some marginal areas of coastal salt marsh habitat. The nearest occurrence is located 0.4 mi NW of the project in between Fagan and Steamboat Sloughs.
Lasthenia conjugens	Contra Costa goldfields	E/--/1B	Cismontane woodland, playas, valley and foothill grassland, vernal pools/mesic, blooms Mar-Jun, 0 - 470 m. Critical Habitat: The project area does not fall within the nearest critical habitat unit #3 (USFWS 2003).	Not likely to occur. No typical grassland vernal pool habitat. The nearest occurrence is 2.4 mi N of the project area.

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Trifolium amoenum	Showy Indian clover	E/--/1B	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite), blooms Apr-Jun, 5 - 415 m.	Not likely to occur. The nearest historical occurrence is 0.2 mi NW of the project area from 1952. Recent surveys in 1987 found no plants in the former location of occurrence and it is possibly extirpated at this site (CNDDB 2005). Only one known thriving population of approximately 200 plants (found in 1996) exists in Marin County (USFWS 2006).
Federal, State and CNPS proposed, candidate or species of concern				
Amorpha californica var. napensis -	Napa false indigo	SLC/--/1B	Openings in broadleafed upland forest, chaparral, cismontane woodland; blooms Apr-Jul; elevation range 120 - 2000 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. The nearest occurrence is located 6.0 mi NW of the project area on Arrowhead Mtn in upland forest habitat.
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	SC/R/1B	Broadleafed upland forest, chaparral, (often serpentinite); blooms Feb-Apr; elevation range 75 - 300 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. There are no known occurrences in the vicinity.
Arctostaphylos canescens ssp sonomensis	Sonoma manzanita	SLC/--/1B	Chaparral, lower montane coniferous forest (sometimes serpentinite); blooms Jan-Apr; elevation range 180 - 1675 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. There are no known occurrences in the vicinity.

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Arctostaphylos hookeri ssp. montana	Mt. Tamalpais manzanita	--/--/1B	Chaparral, valley and foothill grassland (serpentinite); blooms Feb-Apr; elevation range 160 - 760 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. The nearest occurrence is located 11.3 mi. SW of the project area.
Aster lentus	**Suisun Marsh aster**	**SC/--/1B**	**Marshes and swamps (brackish and freshwater); blooms May-Nov; elevation range 0 - 3 m.**	**Potential to occur. The project area has suitable high marsh habitat along the river levee. The nearest occurrence is located in southern portion of Fagan Marsh approximately 0.1 mi. N of where Fagan Slough intercepts the project area boundary. The population is presumed extant (CNDDB 2005).**
Astragalus tener var. tener	**Alkali milk-vetch**	**SC/--/1B**	**Playas, valley and foothill grassland and vernal pools; often on alkaline soils; blooms Mar-June; elevation range 1 - 60 m.**	**Potential to occur. The project area may contain some suitable habitat. The nearest occurrence is located 1.4 mi. SE of the project site on alkali coastal prairie.**
Atriplex joaquiniana	**San Joaquin spearscale (=saltbush)**	**SC/--/1B**	**Chenopod scrub, meadows and seeps, playas and valley and foothill grassland; typically with alkaline soils; blooms Apr-Oct; elevation range 1 - 835 m.**	**Potential to occur. The project area may contain some suitable habitat. The nearest occurrence is located 1.1 mi. SE of the project area along Salicornia Marsh in grassy barren soils.**
Balsamorhiza macrolepis var macrolepis	Big-scale (=California) balsamroot	SLC/--/1B	Chaparral, cismontane woodland, valley and foothill grassland, and sometimes serpentinite; blooms Mar-Jun; elevation range 90 - 1400 m.	Not likely to occur. The project site does not provide typical habitat characteristics associated with the species. The nearest occurrence is located 3.0 mi. E of the project area.

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Blepharizonia plumosa	Big tarplant	--/--1B	Valley and foothill grasslands, plains; blooms Jul – Oct; elevation range 30 - 505 m.	Not likely to occur. The project site does not provide typical habitat characteristics associated with the species. The nearest occurrence is located 9.7 mi. SE of the project area.
Brodiaea californica var leptandra	Narrow-anthered California brodiaea	SLC/--/1B	Broadleafed upland forest, chaparral, lower montane coniferous forest; blooms May-Jul; elevation range 110 - 915 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. The nearest occurrence is located 5.5 mi. NW of the project area on Arrowhead Mtn.
Calochortus pulchellus	Mt. Diablo fairy-lantern	SLC/--/1B	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland; blooms Apr-Jun; elevation range 30 - 840 m.	Not likely to occur. The project site does not provide typical habitat characteristics associated with the species. The nearest occurrence is located 7.9 mi. NE of the project area in oak woodland habitat.
Castilleja ambigua ssp. ambigua	**Salt marsh owl's clover (=johnny-nip)**	**SLC/--/--**	**Coastal bluffs, salt marshes, grassland; elevation range <150 m.**	**Potential to occur. The project area contains suitable habitat. There are no known occurrences in the vicinity.**
Ceanothus purpureus	Holly-leaved ceanothus	SLC/--/1B	Chaparral, cismontane woodland, volcanic, rocky; blooms Feb-Jun; elevation range 120 - 640 m.	Not likely to occur. The project site does not provide typical habitat characteristics associated with the species. The nearest occurrence is located 5.2 mi. NE of the project area.

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Ceanothus sonomensis	Sonoma ceanothus	SC/--/1B	Chaparral (sandy, serpentinite or volcanic); blooms Feb-Apr; elevation range 215 - 800 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. The nearest occurrence is located 10.4 mi. NW of the project area.
Centromadia parryi ssp. congdonii	**Congdon's tarplant**	**--/--1B**	**Valley and foothill grassland (alkaline); blooms May-Nov; elevation range 1 - 230 m.**	**Potential to occur. The project area may contain areas of suitable habitat. The nearest occurrence is located 9.1 mi. SE of the project area on coastal prairie habitat.**
Centromadia parryi ssp. parryi	**Pappose tarplant**	**--/--/1B**	**Coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic and often alkaline); blooms May-Nov; elevation range 2 - 420 m.**	**Potential to occur. The project area may contain areas of suitable habitat. The nearest occurrence is located 7.1 mi. E of the project area.**
Dirca occidentalis	Western leatherwood	SLC/--/1B	Coniferous forests, cismontane woodlands, riparian scrub, riparian woodland; blooms Jan-Apr; elevation range 50 - 395 m.	No potential to occur. The project area does not contain suitable habitat and is outside the typical elevation range for the species. The nearest occurrence is located 10.1 mi. SE of the project area in coastal scrub/oak woodland habitat.
Downingia pusilla	**Dwarf downingia**	**--/--2**	**Valley and foothill mesic grassland, vernal pools; blooms Mar-May; elevation range 1 - 445 m.**	**Potential to occur. The project area may support some suitable habitat. The nearest occurrence is located 2.0 mi. NE of the project area.**

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Erigeron angustatus	Narrow-leaved daisy	--/--/1B	Chaparral (serpentinite or volcanic); blooms May-Sep; elevation range 80 - 290 m.	No potential to occur. The project area does not contain any suitable habitat and is outside the typical elevation range. The nearest occurrence is located 10.6 mi. N of the project area in chaparral habitat.
Eriogonum caninum	Tiburon buckwheat	SLC/--/3	Chaparral, coastal prairie, valley and foothill grassland / serpentinite; blooms: Jun-Sep; elevation range: 10 - 500 m.	Not likely to occur. The project area contains some grassland areas, but does not support the typical higher elevation upland habitat required of the species. There are no known occurrences in the project vicinity.
Fritillaria liliacea	Fragrant fritillary	--/--/1B	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland (often serpentinite); blooms Feb-Apr; elevation range 3 - 410 m.	Not likely to occur. The project area contains some grassland areas, but does not support the typical habitat required of the species. The nearest occurrence is located 4.6 mi. S of the project area in coastal prairie habitat.
Helianthella castanea	Diablo helianthella (=rock-rose)	SC/--/1B	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland; blooms: Mar-Jun; elevation range 60 - 1300 m.	Not likely to occur. The project area contains some grassland areas, however not the typical upland woodland/scrub habitat characteristics. The nearest occurrence is located 8.7 mi. S of the project area in chaparral habitat.

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Hesperolinon breweri	Brewer's dwarf-flax (=western flax)	SC/--/1B	Chaparral, cismontane woodland, valley and foothill grassland (usually serpentinite); blooms May-Jul; elevation range 30 - 900 m.	Not likely to occur. While the project site offers some grassland habitat, the project site does not provide suitable habitat characteristics, which includes higher elevation upland vegetation communities. The nearest occurrence is located 10.3 mi NE of the project area in chaparral habitat.
Juglans hindsii	Northern California black walnut	--/--/1B	Riparian forest, riparian woodland; blooms Apr-May; elevation range 0 - 440 m.	Not likely to occur. Although the site is within the elevation range of this species, there is no riparian forest or known cultivars on the project site. The nearest occurrence is located 5.4 mi. N of the project area.
Lathyrus jepsonii var. jepsonii	**Delta tule-pea**	**SC/--/1B**	**Marshes and swamps (freshwater and brackish); blooms May-Sep; elevation range 0 - 4 m.**	**Potential to occur. The project area may contain suitable high marsh habitat along the river and Fagan Slough. Occurrences occur adjacent to the site in between Fagan Marsh and the airport, Coon and Edgerley Islands.**
Legenere limosa	Legenere	SC/--/1B	Vernal pools; blooms Apr-Jun; elevation range 1 - 880 m.	Not likely to occur. While there are some vernal pools near the Napa County Airport, there is no suitable vernal pool habitat within the project area. The nearest occurrence is located 2.4 mi. N of the project area in vernal pool habitat.

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Lilaeopsis masonii	**Mason's lilaeopsis**	**SC/R/1B**	**Marshes and swamps (brackish or freshwater), riparian scrub; blooms Apr-Nov; elevation range 0 - 10 m.**	**Known to occur. The project area contains suitable habitat. The species has been identified within the project area north of the barge channel on the outboard levee.**
Leptosiphon (=Linanthus) jepsonii	Jepson's linanthus	SLC/--/1B	Chaparral, cismontane woodland (usually volcanic); blooms Apr-May; elevation range 100 - 500 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. There are no known occurrences within the project vicinity.
Lupinus sericatus	Cobb Mountain lupine	SLC/--/1B	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest; blooms Mar-Jun; elevation range 275 - 1525 m.	No potential to occur. The project site does not contain suitable habitat and is outside the typical elevation range. The nearest occurrence is located 11.5 mi. NW of the project area.
Monardella villosa ssp globosa	Robust monardella (=robust coyote mint)	SLC/--/1B	Openings in chaparral, cismontane woodlands, broadleaf upland forest, coastal scrub, and valley and foothill grassland; blooms Jun-Jul; elevation range 100 - 915 m.	Not likely to occur. The project area does contain grassland vegetation, however the project site is not within the typical elevation range of the species. The nearest occurrence occurs 9.7 mi. SE of the project area.
Polygonum marinense	**Marin knotweed**	**SLC/--/3**	**Marshes and swamps (coastal salt or brackish); blooms Apr-Oct; elevation range 0 - 10 m.**	**Potential to occur. The project area contains some suitable habitat. The nearest occurrences are just south of the project area and in Fagan Marsh 0.1 mi N of the project area.**

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (continued)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Rhynchospora californica	California beaked-rush	--/--/1B	Bogs and fens, lower montane coniferous forest, meadows and seeps, marshes and swamps (freshwater); blooms May-Jul; elevation range 45 - 1010 m.	Not likely to occur. The project area offers some freshwater marsh areas, however does not contain montane forest or meadow habitat and is not within the typical elevation range of the species. The nearest occurrence is located 9.7 mi N of the project area in freshwater marsh habitat.
Senecio aphanactis	Rayless ragwort	--/--/2	Chaparral, cismontane woodland, coastal scrub, often on alkaline soils; blooms January-April; elevation range 15 - 800 m.	Not likely to occur. The project area contains alkaline soils, however this species more likely occurs at slightly higher elevations in vegetation communities that may be near, but not on the project site. The nearest occurrence is located 6.6 mi S of the project area on barren clayey soils.
Sidalcea hickmanii ssp. viridis	Marin checkermallow (=checkerbloom)	SLC/--/1B	Chaparral (serpentinite); blooms May-Jun; elevation range 50 - 645 m.	No potential to occur. The project area does not contain any chaparral vegetation or serpentine soils. The nearest occurrence is 9.9 mi NE of the project area in mixed chaparral habitat at a higher elevation than the project site.
Spartina foliosa	**Pacific cordgrass (=California cordgrass)**	**SLC/--/--**	**Salt marshes, mudflats, shores; elevation range: < 10 m.**	**Present. The project area provides some tidal marsh habitat. The nearest known occurrence is located approximately 0.4 mi E of the project area on Coon Island.**

[1]Bold text indicates species with the potential to occur in the Project Area

Table 4.2-4 (concluded)
Listed Plant Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Trifolim depauperatum var. hydrophilum	**Water sack (=saline) clover**	**SC/--/1B**	**Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools; blooms Apr-Jun; elevation range 0 - 300 m.**	**Potential to occur. The project area provides some tidal marsh habitat. The nearest occurrence is located 2.3 mi N of the project area at Suscol Plain on marshy volcanic soils.**
Viburnum ellepticum	Oval-leaved viburnum	--/--/2	Chaparral, cismontane woodland, lower coniferous forest; blooms May-June; elevation range 215 - 1400 m.	No potential to occur. The project area does not contain suitable habitat and is not within the typical elevation range of the species. The nearest occurrence is located 4.7 mi. NW of the project area.

E – Endangered under the Federal or State Endangered Species Act
T – Threatened under the Federal or State Endangered Species Act
SC – Federal species of concern
SLC – Federal species of local concern
R – California rare species
Source: NSMRP EIR, USFWS species list, and CNDDB search for nine quadrangles surrounding the project area.
California Native Plant Society (CNPS)
1B – Plant species that are rare, threatened, or endangered in California and elsewhere
2 – Plant species that are rare, threatened, or endangered in California but more common elsewhere
3 – Plant species about which we need more information (a review list)

[1]Bold text indicates species with the potential to occur in the Project Area

4.2.3.2 Special-Status Terrestrial Wildlife

Terrestrial wildlife refers to land–dependent organisms such as birds (including waterfowl and shorebirds), mammals, reptiles, and amphibians. Several special-status terrestrial wildlife species associated with tidal marsh and seasonal wetland habitats have been reported to occur in the vicinity of the project area. Terrestrial wildlife species with the potential to occur in the vicinity of the project area and those that are known to be present are listed in Table 4.2-5.

Table 4.2-5
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Federal and State threatened and endangered species				
Invertebrates				
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	T/--/--	Occurs in the Central Valley region in association with blue elderberry shrubs. Prefers to lay eggs in elderberry stems greater than 1inch in diameter.	Not likely to occur. No known elderberry shrubs on-site. The nearest occurrence is 11.4 mi NE of the project area.
Speyeria callippe callippe	Callippe silverspot butterfly	E/--/--	Open hillsides where wild pansy (*Viola pendunculata*) grows; larvae feed on wild pansy plants, whereas adults feed on native mints and nonnative thistles	Not likely to occur. Presence depends on presence of host plant. The nearest occurrence is 8.2 mi W of the project area.
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	E/--/--	Inhabits coastal terrace prairie, coastal bluff scrub, and associated nonnative grassland habitats where the larval food plant, *Viola* sp. occurs.	Not likely to occur. Presence depends on presence of host plant. There are no known occurrences of this species or host plant species near the project area.
Amphibians				
Ambystoma californiense	California tiger salamander	T/SSC/--	Annual grasslands and grassy understory of valley-foothill hardwood habitats; needs underground refuges during dry season, need vernal pools or other seasonal water sources for breeding.	Not likely to occur. Lack of annual grassland/woodland habitat with underground burrows. This species does not tolerate salinity levels found in the project area. There are no known occurrences in the project vicinity.
Rana aurora draytoni	California red-legged frog	T/SSC/--	Permanent and semi-permanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation and riparian species along the edges; may aestivate in rodent burrows or cracks during dry periods. Proposed Critical Habitat: The project area does not fall within the proposed critical habitat (USFWS 2005a).	Not likely to occur. Lack of riparian and freshwater habitats in the project area. This species does not tolerate salinity levels found in the project area. The nearest occurrence is located 2.6 mi E of the project area.

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Reptiles				
Masticophis lateralis euryxanthus	Alameda whipsnake	T/T/--	Chaparral including northern coastal sage scrub and coastal sage and grassland rock outcrop areas adjacent to chaparral areas. Proposed Critical Habitat: The project area is not located near any proposed critical habitat for Alameda whipsnake (USFWS 2005b).	Not likely to occur. There is a lack of chaparral, coastal sage scrub, and grassland communities in the project area. There are no known species occurrences in the project vicinity.
Thamnophis gigas	Giant garter snake	T/T/--	Marshes and sloughs; less likely around slow moving water of creeks.	Not likely to occur. There are no known occurrences of this species within the nine USGS quadrangles surrounding the project area.
Birds				
Charadrius alexandrinus nivosus	**Western snowy plover**	**T/SSC/--**	**Coastal beaches above the normal high-tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent.**	**Known to occur. Two individuals were sighted in the project area in July 2004 at Pond 9 (USGS 2005).**
Falco peregrinus anatum	American peregrine falcon	D/E/--	Cliff ledges, particularly near shores and marshes.	Not likely to occur. Project area offers some limited foraging habitat, however there are no suitable nesting ledges or cliffs in the area. There are no known occurrences in the project vicinity.
Empidonax traillii brewsteri	Little willow flycatcher	--/E/--	Summer resident of montane wet meadow or riparian habitats 2,000-8,000 feet elevation. Fall and spring migrant to North Coast areas. Nests in dense riparian cover, typically willows. Summer migrant in the project area.	No potential to occur. The project area has no suitable habitat and is out of the typical elevation range of the species. There are no known occurrences in the project vicinity.

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Grus canadensis tabida	Greater sandhill crane	--/T/--	Summer habitat includes wet meadows, shallow lacustrine, and fresh emergent wetland habitats. Winter use includes grasslands and agricultural grain fields. Feeds on grass shoots, worms, insects, aquatic invertebrates, and small reptiles, and amphibians. Breeding range occurs from northern Nevada and northern California to Canada. Breeds on tundra, marshes, and grasslands.	Not likely to occur. The project site does not contain ideal habitat characteristics. There are no known occurrences in the project vicinity.
Haliaeetus leucocephalus	Bald eagle	T/E/--	Nests and roosts in large diameter trees or snags near large water bodies where prey is abundant.	Not likely to occur. Potential foraging habitat along Napa River, no nesting habitat. There are no known occurrences of this species near the project area.
Laterallus jamaicensis coturniculus	**California black rail**	**--/T/--**	**Mainly inhabits salt marshes bordering large bays. It inhabits saltwater, brackish, and freshwater marshes. Nests and forages in dense pickleweed.**	**Potential to occur. Project area has minimal suitable nesting and foraging areas. Nearest occurrences are located in Fagan Marsh, Fly Bay, and Coon Island.**
Pelecanus occidentalis californicus	California brown pelican	E/E/--	Estuarine, marine subtidal, and marine pelagic waters along the California coast.	Not likely to occur. There are no known occurrences of this species near the project area. Wandering pelicans may utilize the San Pablo Bay for foraging and mudflats for cover.

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Rallus longirostris obsoletus	**California clapper rail**	**E/E/--**	**Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickleweed; feeds on mollusks removed from the mud in sloughs.**	**Potential to occur. Salt marsh habitat and sloughs in adjacent properties provide favorable habitat for the species presence. Project area has minimal suitable habitat. Nearest occurrences are in Fagan Marsh north of the project area near Fagan Slough and west in Fly Bay and Mud Slough between Coon and Edgerley Islands.**
Riparia riparia	Bank swallow	--/T/--	Riparian, lucustrine, and coastal lowland habitats with vertical banks of fine textured or sandy soils to burrow nesting holes.	No potential to occur. There is no suitable habitat in the project area. There are no known occurrences in the vicinity of the project area.
Sterna antillarum (=albifrons) browni	California least tern	E/E/--	Breeds in colonies along marine and estuarine shores and in the SF Bay area along abandoned salt ponds. Forages for small fish in estuaries and lagoons.	Not likely to occur. Northern-most breeding population is at the Pittsburg Power Plant. There are no known nearby occurrences of this species.
Strix occidentalis caurina	Northern spotted owl	E/SSC/--	In northern California, resides in dense, old-growth, multi-layered mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2300 m (0-7600 ft).	No potential to occur. Lack of dense, old growth, conifer forest in the project area. There are no known nearby occurrences of this species.

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Mammals				
Reithrodontomys raviventris	**Salt marsh harvest mouse**	**E/E/--**	**Salt marshes with a dense plant cover of pickleweed and fat hen adjacent to an upland site.**	**Potential to occur. Favorable vegetation and habitat characteristics occur in small areas within the project site. Nearest occurrences are in Fagan Marsh north of the project area near Fagan Slough and west in Fly Bay and Mud Slough between Coon and Edgerley Islands. 42 mice were collected along Ponds 4 & 5 of the NSMRP during surveys conducted from September 9-11, 2005. (Takekawa et al. 2005)**
Federal and State candidate or species of concern				
Invertebrates				
Nothochrysa californica	San Francisco lacewing	SC/--/--	Coastal scrub and woodland habitats.	Not likely to occur. No suitable habitat in project area. There are no known occurrences in the project vicinity.
Incisalia mossii marinensis	Marin elfin butterfly	SC/--/--	Coastal scrub with cliffs or rock outcrops; host plant is stonecrop (*Sedum spathulifolium*).	Not likely to occur. Appropriate habitat characteristics are not present in the project area. There are no known occurrences in the vicinity of the project area.
Amphibians				
Rana aurora aurora	Northern red legged frog	SC/SSC/--	Breeds in pools with emergent vegetation; typically absent in pools where predatory fish are present; require adequate hibernacula such as small mammal burrows and moist leaf litter.	Not likely to occur. Appropriate freshwater habitat characteristics are not present in the project area. There are no known occurrences in the vicinity of the project area.

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Rana boylii	Foothill yellow-legged frog	SC/--/--	Fast-moving rivers and streams in chaparral, forests, and woodlands.	No potential to occur. No suitable habitat in project area. There are no known occurrences in the project vicinity.
Spea hammondii (was *Scaphiopus h.*)	Western spadefoot toad	SC/SSC/--	Primarily found in grasslands; also found in hardwood woodlands; vernal pools are essential for breeding and egg-laying.	Not likely to occur. No suitable habitat in the project area. There are no known occurrences in the project vicinity.
Reptiles				
Clemmys marmorata marmorata	Northwestern pond turtle	SC/SSC/--	Rivers and streams with some canopy cover. Inhabits ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Need basking sites and sandy banks or open grassy fields for egg-laying.	Not likely to occur. The project site does not support suitable freshwater pools or marsh habitat. The nearest occurrence is located 0.12 mi E of the project area in a pool on North Slough.
Clemmys marmorata pallida	Southwestern pond turtle	SC/SSC/--	Rivers and streams with some canopy cover. Inhabits ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Need basking sites and sandy banks or open grassy fields for egg-laying.	Not likely to occur. The project site does not support suitable freshwater pools or marsh habitat. There are no known occurrences in the project vicinity.
Phrynosoma coronatum frontale	California horned lizard	SC/SSC/--	Inhabits variety of habitats, usually lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial. Must have abundant ants and other insects.	Not likely to occur. Soft sandy soil may provide marginal habitat, however the disturbances and lack of many shrub areas reduce the likelihood. There are no known occurrences in the project vicinity.
Birds				
Agelaius tricolor	Tricolored blackbird	SC/SSC/--	Nomadic resident of Sacramento-San Joaquin Valley and low foothills; nests colonially in vicinity of fresh water, marshy areas. Colonies prefer heavy growths of cattails and tules.	Not likely to occur. No suitable habitat exists within the project site. There are no known occurrences in the project vicinity.

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Amphispiza belli belli	Bell's sage sparrow	SC/SSC/--	Nests within dense chaparral and sage scrub habitat, winters in more open habitat; known from Shasta, San Diego, El Dorado, and Mariposa Counties.	Not likely to occur. Appropriate habitat characteristics are not present in the project area. There are no known occurrences in the project vicinity.
Athene cunicularia hypugaea	**Western burrowing owl**	**SC/SSC/--**	**Inhabits open, grasslands and scrublands characterized by low-growing vegetation. Subterranean nester dependent upon burrowing mammals, specifically California ground squirrel.**	**Potential to occur. Levees with burrows provide suitable habitat for burrowing owls. The nearest occurrence is located 1.9 mi. SW of the project area on Skaggs Island.**
Baeolophus inornatus	Oak titmouse	SLC/--/--	Year round resident of oak and oak-pine woodlands, sometimes juniper woodlands, cavity nester.	Not likely to occur. The project site has no suitable nesting or foraging habitat. There are no known occurrences in the project vicinity.
Buteo regalis	**Ferruginous hawk**	**SC/SSC/--**	**Inhabits open grasslands, low foothills and desert scrub; nests in trees, low cliffs, and other elevated structures. Eats mainly lagomorphs, and other small mammals; also birds, amphibians, and reptiles. No nesting records in California.**	**Potential to occur. Site offers some foraging habitat. There are no known occurrences in the project vicinity.**
Calidris canutus	**Red knot**	**SC/--/--**	**Migrant of coastal estuarine sand or mudflats, less often on sandy beaches of the outer coast.**	**Potential to occur. Mudflats may provide suitable foraging habitat. There are no known occurrences in the project vicinity.**

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Calypte costae	Costa's hummingbird	SC/SSC/--	Inhabits desert wash, edges of desert riparian and valley foothill riparian, coastal scrub, desert scrub, desert succulent shrub, lower-elevation chaparral, and palm oasis. Ranges from south-central California to Mexico. Winters from southern California to Mexico. Feeds primarily on nectar, but will also take small insects and spiders.	Not likely to occur. Appropriate habitat characteristics are not present in the project area; however known to frequent various habitats throughout the state. There are no known occurrences in the project vicinity.
Carduelis lawrencei	Lawrence's goldfinch	SC/--/--	Oak chaparral woodland. Typically nests in dense oaks or cypress.	Not likely to occur. No suitable habitat exists near the project site. There are no known occurrences in the project vicinity.
Chaetura vauxi	Vaux's swift	SC/SSC/--	Summer resident of redwood and Douglas fir forests with hollow trees and snags.	No potential to occur. No suitable habitat found in the project area. There are no known occurrences in the project vicinity.
Cypseloides niger	Black swift	SC/SSC/--	Mountains and coastal cliffs. Nests in a moist crevice or cave on coastal cliffs or behind or adjacent to waterfalls in deep canyons.	No potential to occur. No suitable habitat found in the project area. The nearest occurrence is 12.7 mi NW of the project area.
Elanus leucurus	**White-tailed (=black shouldered) kite**	**SC/FP/--**	**Nests in dense oak, willow, or other tree stands near open grassland meadows, farmlands, and emergent wetlands.**	**Potential to occur. The project area provides suitable foraging area. The nearest occurrence is located 7.5 mi E of the project area.**
Falco peregrinus anatum	American peregrine falcon	D/FP/--	Nests on protected cliffs near large water bodies where prey is abundant; uncommonly found in the Central Valley as a winter resident. Nests from central Alaska across north-central Canada to central Mexico, winters to South America.	Not likely to occur. Appropriate nesting habitat is not present in the project area, however may frequent the area for foraging. There are no known occurrences of this species in the project vicinity.

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Geothlypis trichas sinuosa	**Saltmarsh common yellowthroat (=San Francisco) common yellowthroat**	**SC/SSC/--**	**San Francisco Bay region in fresh and saltwater marshes with thick continuous cover to water surface, tall grasses, tule patches and willows for nesting.**	**Potential to occur. The project area offers some suitable foraging habitat and little nesting habitat. The nearest occurrence is located adjacent to the project area in Fagan Marsh and Coon Island.**
Lanius ludovicianus	Loggerhead shrike	SC/SSC/--	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest densities known from open-canopied hardwoods and riparian habitats, but also occurs in open croplands. Nests in dense shrubs and brush near open foraging areas such as grasslands. Forages on large insects, small birds, mammals, amphibians, reptiles, fish, carrion, and invertebrates.	Not likely to occur. The project area does not contain any riparian or dense shrub habitat. There are no known occurrences in the project vicinity.
Limosa fedoa	**Marbled godwit**	**SC/--/--**	**Winter visitant of estuarine habitats throughout the state. Forages in mudflats and sandy areas with shallow water. Requires undisturbed emergent wetland, fields, or salt ponds for roosting during high tide.**	**Potential to occur. The project area contains suitable foraging and roosting habitat. There are no known occurrences in the project vicinity.**
Melanerpes lewis	Lewis' woodpecker	SC/--/--	Suitable habitat includes open deciduous and conifer habitats with brushy understory, with scattered snags and live trees for nesting and perching. Forages primarily on insects in spring and summer, fruits, acorns, nuts, and seeds other times of year.	No potential to occur. The project area does not contain any suitable habitat. There are no known occurrences in the project vicinity.

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Melospiza melodia maxillaris	Suisun song sparrow	SC/SSC/--	Breeds in low shrubby growth and thickets in a variety of habitats, but most often in moist and swampy places. Resident of salt marshes bordering San Pablo Bay. Inhabits marshes dominated by *Salicornia* sp. Nests low on *Grindelia* bushes and in *Salicornia*.	Not likely to occur. The project area offers some suitable marsh habitat, however geographically the species is more likely located in Suisun Bay as the species would compete with San Pablo song sparrow. The nearest occurrence is located 8.2 mi. SE of the project area.
Melospiza melodia samuelis	**San Pablo song sparrow**	**SC/SSC/--**	**Breeds in low shrubby growth and thickets in a variety of habitats, but most often in moist and swampy places. Resident of salt marshes bordering San Pablo Bay. Inhabits marshes dominated by *Salicornia* sp. Nests low on *Grindelia* bushes and in *Salicornia*.**	**Potential to occur. The project area offers some suitable marsh habitat. The nearest occurrence is located on Coon Island west across the Napa River from the project area.**
Numenius americanus	**Long-billed curlew**	**SC/SSC/--**	**Nests near water in prairies and grassy meadows. Forages in mudflats during low tide probing the mud for invertebrates. Finds cover in coastal estuaries, high salt marsh, pastures, and salt ponds during high tide periods.**	**Potential to occur. The project area offers good foraging and roosting habitat. There are no known occurrences in the vicinity of the project area.**
Rynchops niger	Black skimmer	SC/SSC/--	Nests in coastal beaches or sandbars. Forages in shallow water.	Not likely to occur. Range is mostly southern CA coast and Salton Sea. There are no known occurrences in the vicinity of the project area.
Selasphorus rufus	Rufous hummingbird	SC/--/--	Breeds north of California in coniferous forests. Winters in south to south central Mexico. Uses valley foothill hardwood, valley foothill hardwood conifer, riparian, and various chaparral habitats with nectar-producing flowers during migration. Besides nectar, also feeds on insects, spiders, and tree sap.	Not likely to occur. Appropriate habitat characteristics are not present in the project area. There are no known occurrences in the vicinity of the project area.

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Selasphorus sasin	Allen's hummingbird	SC/--/--	Coastal scrub, valley foothill hardwood, valley foothill riparian, closed-cone pine-cypress, redwood, and urban habitats. Builds nests in trees, shrubs, vines, and ferns.	Not likely to occur. Appropriate habitat characteristics are not present in the project area. There are no known occurrences in the vicinity of the project area.
Toxostoma redivivum	California thrasher	SC/--/--	Moderate to dense chaparral or riparian habitat in the foothills and lowlands of cismontane California at elevations ranging 1,500-2,000 m. Builds a nest in a large shrub or a scrubby tree.	No potential to occur. Appropriate habitat characteristics are not present in the project area. The project area is not within the typical elevation range of the species. There are no known occurrences in the vicinity of the project area.
Mammals				
Corynorhinus (=Plecotus) townsendii townsendii	Pacific western big-eared bat	SC/--/--	Roosting sites include caves and cave-type dwellings such as tunnels, mines, and bridges. Feeds primarily on moth species in a variety of habitats except subalpine and alpine communities. Tend to forage within 2.4 km (1.5 mi) of roosting areas.	Not likely to occur. Appropriate habitat characteristics are not present in the project area. There are no known occurrences in the vicinity of the project area.
Eumops perotis californicus	Greater western mastiff-bat	SC/SSC/--	Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Not likely to occur. Appropriate habitat characteristics are not present in the project area. There are no known occurrences in the vicinity of the project area.
Myotis evotis	**Long-eared myotis bat**	**SC/--/--**	**Widespread in California, avoids the arid Central Valley and hot deserts. Forages over grasslands and roosts in trees, buildings, caves, and rock crevices.**	**Potential to occur. Buildings structures may provide roosting habitat. There are no known occurrences in the vicinity of the project area.**

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-5 (continued)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Myotis thysanodes	Fringed myotis bat	SC/--/--	Widespread in California, occurring in all but the Central Valley and Colorado and Mojave deserts; generally at 1,300-2,000 m. Forages over grasslands and roosts in trees, buildings, caves, and rock crevices.	Not likely to occur. The project area is not within the typical higher elevation range of the species. There are no known occurrences in the vicinity of the project area.
Myotis volans	Long-legged myotis bat	SC/--/--	Coast ranges, Cascade/Sierra ranges, Mojave Desert mountains, common above 1,200 m. Not present in the Central Valley. Roost in tree crevices, exfoliating barks and snags.	Not likely to occur. The project area is not within the typical higher elevation range of the species. There are no known occurrences in the vicinity of the project area.
Myotis yumanensis	Yuma myotis bat	SC/--/--	Forests and woodlands with sources of water over which to feed; roosts in buildings, mines, caves, crevices, and occasionally under bridges.	Not likely to occur. The project area does not contain suitable habitat for the species. There are no known occurrences in the vicinity of the project area.
Perognathus inornatus	San Joaquin pocket mouse	SC/SSC/--	Dry open grasslands, blue oak savannas between 350-600 m. in the Central and Salinas Valleys. Needs fine textured, friable soils.	Not likely to occur. The project area does not contain suitable habitat for the species. There are no known occurrences in the vicinity of the project area.
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	SC/SSC/--	Forest riparian communities of moderate canopy and moderate to dense understory of favorable stick nest building materials.	Not likely to occur. The project area does not contain suitable habitat for the species. There are no known occurrences in the vicinity of the project area.
Sorex ornatus sinuosus	**Suisun ornate shrew**	**SC/SSC/--**	**Tidal marshes of the northern shores of San Pablo and Suisun Bays.**	**Potential to occur. The project area offers some areas of tidal marsh habitat. The nearest occurrence is located 1.7 mi. S of the project area along Dutchman and South Sloughs.**

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-5 (concluded)
Listed Terrestrial Wildlife Species (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Sorex vagrans halicoetes	Salt marsh vagrant shrew	SC/SSC/--	Tidal marshes that provide dense cover, abundant food (primarily invertebrates), suitable nesting sites (dense canopy of pickleweed and Spartina duff), and fairly continuous ground moisture (offered by driftwood and debris).	Not likely to occur. The project area offers some pickleweed and tidal marsh habitat, but it is fragmented and small in spatial extent. Moreover, there are no known occurrences in the vicinity of the project area.
Zapus trinotatus orarius	Point Reyes jumping mouse	SC/SSC/--	Bunch grass marshes on the uplands that are safe from continuous inundation. Know range is in the Point Reyes area.	Not likely to occur. Very limited poor habitat present; outside know range. There are no known occurrences in the vicinity of the project area.

E – Endangered under the Federal or State Endangered Species Act

T – Threatened under the Federal or State Endangered Species Act

FP – Fully Protected under the State Endangered Species Act

C – Candidate for listing status

D – Federal delisted species

SC – Federal species of concern

SLC – Federal species of local concern

SSC – California species of special concern

Source: NSMRP EIR, USFWS species list, and CNDDB search for nine quadrangles surrounding the project area.

[1]Bold text indicates species with the potential to occur in the proposed project area

Target special-status species surveys will be conducted, as needed, prior to construction to determine presence or absence of special-status species with the potential to occur in the project area. Summaries of the life history and habitat requirements for threatened or endangered species that have the potential to occur in the project area are provided in the section below. These species summaries have been adapted from the NSMRP EIR (CSCC and CDFG 2004). Information that is to the supplemental NSMRP EIR is provided in square brackets. (Species with status other than threatened or endangered are not discussed further.)

Birds

- **Western Snowy Plover.** The western snowy plover is federally listed as threatened and state-listed as a species of special concern. Nests and plovers have also been observed on levees and mudflats throughout the region. Two snowy plovers were observed in the project area by USGS in July 2004 in CB9 (USGS 2005). Snowy plovers have been observed in NSMRP Ponds 4, 5, 6, and 7A from October 2003 to June 2005 across the river from the project area (Takekawa et al. 2005). This species forages along the tidal flats and salt ponds. Roosting occurs along the levees of dry or partly dry salt ponds and sandy tidal flats. Nesting occurs on the ground on barren or sparsely vegetated salt pond levees and edges and along lagoon margins. Snowy plovers move among the breeding, foraging, and roosting sites during all seasons (Goals Project 2000). Part of the San Francisco Bay population of snowy plovers is resident and part is migratory.
- **California Black Rail.** The California black rail is a state-listed threatened species and a federal species of concern. This species prefers pickleweed-dominated marsh habitat but also occurs in freshwater and brackish marshes (Evens et al. 1991). Preferred breeding habitat includes areas of mature, higher-elevation marshes dominated by bulrush (*Scirpus* spp.) and pickleweed. The species' reliance on tidally influenced, vegetated, elevated salt marsh habitat makes it a valuable indicator species of mature, upper tidal marsh habitat (Goals Project 2000). California black rail occurs at a number of sites in the San Francisco Bay area, perhaps more concentrated in the northern part of the bay. The species will nest in higher areas of freshwater marshes, wet meadows, and salt marshes (Eddleman et al. 1994). [Black rail are not likely to occur in the project area, but have been documented in Fagan Marsh. In fact, an earlier study found Fagan Marsh to support some of the highest densities of black rails in the estuary (Evens et al. 1989). Two black rail detections have been reported from the marshes fringing NSMRP Ponds 4 and 5 (Takekawa et al. 2005).]
- **California Clapper Rail.** The California clapper rail is both federally listed and state-listed as endangered. It is considered nonmigratory and occurs primarily in emergent salt marsh and brackish tidal marsh habitats with extensive areas of cord grass, saltgrass, pickleweed, alkali heath, jaumea, and rush. The network of tidal sloughs near the project area, being rich in tidal invertebrates, provides important foraging habitat (DeGroot 1927; Harvey 1988; Collins et al. 1994) and escape routes from predators (Zembal and Massey 1983; Foerster et al. 1990). Rail density appears to be positively correlated with channel density. Clapper rail nests are generally located along tidal channels in pickleweed-dominated marshes (Collins and Evens 1992). [The project area does not provide suitable habitat for clapper rails. Currently, the closest breeding population to the site is at Coon Island. In the late 1980s and early 1990s, clapper rails were detected in Fagan Marsh and Bull Island (Evens, pers. comm.,

2005).] Breeding populations have been identified in numerous locations of the lower Napa River estuary: Dutchman Slough, Napa Slough, Devil's Slough (Gill 1979), and White Slough. [A single clapper rail was detected during four surveys in NSMRP Pond 2A (Takekawa et al. 2005).]

Mammals

- **Salt Marsh Harvest Mouse.** The salt marsh harvest mouse is federally listed as threatened and state-listed as endangered. It is also fully protected under Section 4700 of the California Fish and Game Code.

  There are two subspecies of salt marsh harvest mouse: the northern subspecies (*Reithrodontomys raviventris halicoetes*) in the San Pablo Bay and the Napa River areas and the southern subspecies (*R. r. raviventris*) in the San Francisco Bay area. The two subspecies exhibit subtle differences in biology and habitat use. *R. r. halicoetes* can tolerate fairly large fluctuations in marsh salinity where the average salinity is low (<22 ppt). In contrast, *R. r. raviventris* occurs in marshes where the salinity is high and more stable (27.0–31.2 ppt). The breeding season for *R. r. halicoetes* is May to November. This is shorter than the breeding season for *R. r. raviventris*, which is approximately March to November (Shellhammer et al. 1982; Fisler 1965).

  Optimal habitat for the species consists of saline emergent wetland with thick, perennial plant cover consisting predominantly of pickleweed in association with fat hen and alkali heath (Goals Project 2000; Fisler 1965). To be suitable, salt marsh must have an upper border of peripheral halophytes (salt-tolerant plants) that offers refuge (escape habitat) during high tides or floods (Shellhammer et al. 1982). However, salt marsh harvest mice have been captured in less-than-optimal habitat, such as hypersaline areas and areas with 50 percent bare ground (Zetterquist 1978; Shellhammer et al. 1982), and will move into grasslands and bordering marshes in spring and summer months when maximum cover is present (Fisler 1965; Shellhammer et al. 1982).

  The habitat use of this species may also be affected by other rodent species. For example, in one study, salt marsh harvest mouse was found to use lower quality pickleweed habitat when California voles (*Microtus californicus*) were present in high numbers and to move to higher quality habitat when the vole population diminished (Geissel et al. 1988). Dispersal distances and the minimum patch size of suitable habitat needed to support populations of salt marsh harvest mouse are not well known. In one study, salt marsh harvest mice had a mean home range of 0.53 acre (2,133 square meters) (Bias and Morrison 1999). Salt marsh harvest mice have been observed crossing barriers such as narrow canals (up to 7 feet [2 meters] wide) and levee roads (up to 13 feet [4 meters] wide) and have been reported to swim sloughs up to 23 feet (7 meters) wide (Bias and Morrison 1999; Geissel et al. 1988). Geissel et al. (1988) also reported individuals traveling distances of 280 feet (85 meters) or more.

  Habitat destruction is the greatest threat to salt marsh harvest mouse (USFWS 1984). In addition to habitat reduction, the salt marsh harvest mouse is threatened by flood control, mosquito abatement, marsh subsidence, changes in salinity, plowing, mowing, burning, and artificial flushing. All these conditions have adversely affected habitat quality by changing the composition of plant communities and/or reducing the vegetation required for cover (Shellhammer et al. 1982).

Nearby occurrences of salt marsh harvest mice include Fagan Marsh north of the project area near Fagan Slough and west in Fly Bay and Mud Slough between Coon and Edgerley Islands. [Between September 9-11, 2005, 42 mice were collected during small mammal trapping surveys along Ponds 4 & 5 of the Napa-Sonoma Marsh. (Takekawa et al. 2005). Salt marsh harvest mouse habitat in and near the project site includes seasonal wetland dominated by picklweed, and Fagan Marsh.]

4.2.4 Fisheries and Aquatic Organisms

4.2.4.1 Regional Setting

The Napa River estuary includes tidal channels, marsh, and open water habitats. The project site borders approximately 3.6 miles of the Napa River estuary. Salinity in the Napa River estuary varies from 0 ppt to 30 ppt. Low salinity occurs during winter, when watershed discharge forces saline water downstream. High salinity occurs during the summer and early fall when freshwater outflow is low. Water in the Napa River is typically turbid due to the concentration of suspended sediments (see Section 4.7, Water and Sediment Quality). Sediments in the Napa River near the project are mostly muddy coarse sands, fine clays, and silts.

Since 2001 the Napa River Fisheries Monitoring Program (NRFMP) has performed fish sampling along a 6.9-mile reach of the Napa River beginning approximately 3 miles upstream of the NPSR project. The sampling stations encompass open water, floodplain, and marsh plain habitats. The objective of the NRFMP is to determine fish usage of recently restored and created habitats along the Napa River (NRFMP 2004). Table 4.2-6 provides a list of 36 species captured during NRFMP sampling events between July 2001 and July 2004. Twenty of the species are native, including listed salmonids, and Delta and longfin smelt (discussed further below).

Table 4.2-6
Fish Captured by Napa River Fisheries Monitoring Program (7/01–7/04)
(NRFMP 2004)

Common Name Scientific Name Federal/State	Native or Nonnative	Common Name Scientific Name	Native or Nonnative
American shad *Alosa sapidissima* --/--	Nonnative	Pacific herring *Clupea pallasii* --/--	Native
Arrow goby *Clevelandia ios* --/--	Native	Pacific sanddab *Citharichthys sordidus* --/--	Native
Bay goby *Lepidogobius lepidus* --/--	Native	Prickly sculpin *Cottus asper* --/--	Native
Black crappie *Pomoxis nigromaculatus* --/--	Nonnative	Rainwater killifish *Lucania parva* --/--	Nonnative

Table 4.2-6 (continued)
Fish Captured by Napa River Fisheries Monitoring Program (7/01–7/04)
(NRFMP 2004)

Common Name Scientific Name	Native or Nonnative	Common Name Scientific Name	Native or Nonnative
Bluegill *Lepomis macrochirus* --/--	Nonnative	Sacramento pikeminnow *Ptychocheilus grandis* --/--	Native
Channel catfish *Ictalurus punctatus* --/--	Nonnative	Sacramento splittail *Pogonichthys macrolepidotus* --/SSC	Native
Chinook salmon *Oncorhynchus tshawytscha* --/--	Native	Sacramento sucker *Catostomus occidentalis* --/--	Native
Carp *Cyprinus carpio* --/--	Nonnative	Shimofuri goby *Tridentiger bifasciatus* --/--	Nonnative
Chum salmon *Oncorhynchus keta* --/--	Native	Staghorn sculpin *Leptocottus armatus* --/--	Native
Delta smelt *Hypomesus transpacificus* T/T	Native	Starry flounder *Platichthys stellatus* --/--	Native
Golden shiner *Notemigonus crysoleucas* --/--	Nonnative	Steelhead *Oncorhynchus mykiss* --/T	Native
Inland silverside *Menidia beryllina* --/--	Nonnative	Striped bass *Morone saxatilis* --/--	Nonnative
Jack smelt *Atherinopsis californiensis* --/--	Native	Thread finshad *Dorosoma petenense* --/--	Nonnative
Largemouth bass *Micropterus salmoides* --/--	Nonnative	Threespine stickleback *Gasterosteus aculeatus* --/--	Native
Longfin smelt *Spirinchus thaleichthys* --/SSC	Native	Tule perch *Hysterocarpus traski* --/--	Native
Long-jawed mudsucker *Gillichthys mirabili* --/--	Native	Wakasagi *Hypomesus nipponensis* --/--	Nonnative
Mosquitofish *Gambusia affinis* --/--	Nonnative	White catfish *Ameiurus catus* --/--	Nonnative

Table 4.2-6 (concluded)
Fish Captured by Napa River Fisheries Monitoring Program (7/01–7/04)
(NRFMP 2004)

Common Name Scientific Name	Native or Nonnative	Common Name Scientific Name	Native or Nonnative
Northern anchovy *Engraulis mordax* --/--	Native	Yellowfin goby *Perca flavescens* --/--	Nonnative

T – Threatened under the Federal or State Endangered Species Act
SSC – California species of special concern

4.2.4.2 Project Setting

Tidal Channels

Within the project area, only the barge channel provides a limited area of tidal channel habitat (Figure 2-1, Table 2-1). Tidal channels adjacent to the project area include the Napa River and Fagan Slough. Fish that utilize tidal channel habitat include starry flounder (*Platichthys stellatus*), northern anchovy (*Engraulis mordax*), Sacramento splittail (*Pogonichthys macrolepidotus*), mosquito fish (*Gambusia affinis*), carp (*Cyprinus carpio*), threespine stickleback (*Gasterosteus aculeatus*), and steelhead (*Oncorhynchus mykiss*).

Salt Ponds

Salt ponds with water salinity below 200 ppt may support an invertebrate community that includes brine shrimp (*Artemia franciscana*), brine flies (*Ephydra cinera*, *E. millbrae*, and *Lipochaeta slossonae*). At salinity below 170 ppt water boatmen (*Trichocorixa reticulata*) may also occur (Siegel. and Bachand 2002). Salinities at the project site are higher than fish tolerance limits (URS 2004; Mejia, pers. comm., 2005).

4.2.4.3 Special-Status Fish and Other Aquatic Organisms

Several listed and protected aquatic organisms have been reported to occur in the vicinity of the project area (CNDDB 2005; NRFMP 2004). These species are listed in Table 4.2-7 along with their regulatory status and habitat requirements.

The NSMRP EIR (CSCC and CDFG 2004) summarizes the life history and habitat requirements for many of the special-status aquatic species known to occur in the vicinity of the project area. Summaries for threatened and endangered species are provided below and have been supplemented or modified with additional information where applicable. (Note: supplemental information is indicated by square brackets.) Information on species with a status other than threatened or endangered is provided in the table.

Table 4.2-7
Listed Fish and other Aquatic Organisms (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Federal and State threatened and endangered species				
Invertebrates				
Branchinecta conservatio	Conservancy fairy shrimp	E/--/--	Found in large, turbid pools in the northern 2/3 of the Central Valley; inhabit static pools located in swales formed by old, braided alluvium, filled by winter/spring rains, last until June. Critical Habitat: There are no critical habitat units located near the project vicinity (USFWS 2003).	Not likely to occur. No typical grassland vernal pool habitat in the project area. There are no known occurrences of the species in the project vicinity.
Branchinecta lynchi	Vernal pool fairy shrimp	T/--/--	Common in vernal pools; also found in sandstone rock outcrop pools. Critical Habitat: The project area is located near critical habitat unit #17 which includes the Napa Sonoma Marsh and Fagan Marsh Wildlife Areas adjacent to the project area (USFWS 2003).	Not likely to occur. No typical grassland vernal pool habitat in the project area. The nearest occurrence is located 0.3 mi east of the project area in a vernal pool in grazed grassland is south of the Napa Airport runway.
Syncaris pacifica	California freshwater shrimp	E/E/--	Coastal lowland and low-gradient streams, among exposed live tree roots of undercut banks, overhanging woody debris, or overhanging vegetation. Occurs in 17 stream segments in Napa, Marin, and Sonoma Counties.	Not likely to occur. Only known to occur in Huichica and portions of Sonoma Creek. The project site does not contain suitable undercut banks with woody debris and vegetation hanging over the streambanks. The nearest occurrence is 3.5 mi NW of the project area.

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-7 (continued)
Listed Fish and other Aquatic Organisms (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Fish				
Acipenser medirostris	Green sturgeon	P/SSC/--	Spawns in the swift current of lower reaches of large rivers in coarse cobble substrate. Juveniles spend time in estuarine habitat before migrating to the Pacific Ocean where they spend most of their life span.	Not likely to occur. Only known to spawn in large river systems including the Sacramento, Eel, and Klamath Rivers. The species has been captured in and is known to occur in the San Pablo Bay.
Eucyclogobius newberryi	Tidewater goby	E/SSC/--	Brackish shallow lagoons and slow to still moving water in lower stream reaches where the water salinity levels range from zero to 10 parts per thousand.	Not likely to occur. Site does contain any brackish lagoons or other favorable low salinity aquatic habitat. There are no known nearby occurrences of this species.
Hypomesus transpacificus	**Delta smelt**	**T/T/--**	**Low-mid reaches of San Joaquin-Sacramento Delta.** **Critical Habitat: The project area is not within the defined critical habitat boundary identified by USFWS (USFWS 2003b).**	**Potential to occur. Populations are known to occur in San Pablo Bay and Napa River (Goals Project 2000). The nearest known occurrence is located 1.7 mi S of the project area in former salt Pond 2A.**
Oncorhynchus kisutch	Central California coast Coho salmon	E/E/--	Pacific Ocean, spawn in coastal streams and rivers, over gravel beds.	Not likely to occur. Not known to inhabit the San Pablo Bay of Napa River system. There are no known occurrences in the project vicinity.
Oncorhynchus mykiss irideus	**Central California coast steelhead**	**T/SSC/--**	**Pacific Ocean, spawn in coastal streams and rivers, over gravel beds.** **Critical Habitat: Napa River has been designated as Critical Habitat under the NMFS San Pablo Unit #220610 (NOAA Fisheries 2005a).**	**Potential to occur. The species is known to migrate up the Napa River system. The nearest occurrence is located in North Slough at the culvert crossing with Eucalyptus Dr. 0.3 mi E of the project area.**

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-7 (continued)
Listed Fish and other Aquatic Organisms (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Oncorhynchus mykiss irideus	**Central Valley steelhead**	**T/--/--**	**Pacific Ocean, spawn in coastal streams and rivers, over gravel beds.** **Critical Habitat: Napa River is not designated critical habitat only the passage between the ocean and the Sacramento/San Joaquin River systems (NOAA Fisheries 2005b).**	**Potential to occur. Steelhead may migrate up Napa River. There are no known CNDDB occurrences of this species in the vicinity. The NRFMP captured two steelhead (either Central California Coast or Central Valley Steelhead) in 2004: one in marsh habitat approximately 2.6 miles north of the project site and one in open water habitat approximately 3.4 miles north of the project site (NRFMP 2004).**
Oncorhynchus tshawytscha	**Central Valley fall/late fall-run Chinook salmon**	**C/SSC/--**	**Pacific Ocean, spawn in coastal streams and rivers, over gravel beds.** **Critical Habitat: Not yet designated**	**Potential to occur. Limited numbers of strays have been observed spawning in the Napa River up to the base of Kimball Canyon Dam upstream of Calistoga (NOAA Fisheries 2005c).**
Oncorhynchus tshawytscha	**Central Valley spring-run Chinook salmon**	**T/T/--**	**Pacific Ocean, spawn in coastal streams and rivers, over gravel beds.**	**Potential to occur. Salmon may stray up the Napa River. There are no known occurrences of this species in the vicinity.**
Oncorhynchus tshawytscha	**Sacramento River winter-run Chinook salmon**	**E/E/--**	**Pacific Ocean, spawn in coastal streams and rivers, over gravel beds.** **Critical Habitat: San Pablo Bay waters are designated as Critical Habitat by NMFS in 58 FR 33212 (NMFS 1997).**	**Potential to occur. Salmon may stray up the Napa River. There are no known occurrences of this species in the vicinity.**

[1]Bold text indicates species with the potential to occur in the proposed project area

Table 4.2-7 (continued)
Listed Fish and other Aquatic Organisms (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Federal and State candidate or species of concern				
Invertebrates				
Branchinecta mesovallensis	Midvalley fairy shrimp	SC/--/--	Vernal pools in grasslands in Sacramento, Solano, Contra Costa, Madera, Merced and Fresno Counties.	Not likely to occur. There is no vernal pool grassland habitat in the project area. There are no known occurrences in the project vicinity.
Hydrochara rickseckeri	Ricksecker's water scavenger beetle	SC/--/--	Freshwater habitats including vernal pools, restricted to the Sacramento, Delta and San Francisco Bay Area.	Not likely to occur. The project area contains some lower quality disturbed seasonal wetland areas. There are no known occurrences in the project vicinity.
Linderiella occidentalis	California linderiella fairy shrimp	SC/SSC/--	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan, or in sandstone depressions; water has very low alkalinity, conductivity and total dissolved solids.	Not likely to occur. The project area contains some lower quality disturbed seasonal wetland areas. There are no known occurrences in the project vicinity.
Fish				
Lampetra ayresi	**River lamprey**	**SC/--/--**	**Spawning requires clean, gravelly riffles in permanent streams; ammocoetes require sandy or silty backwaters or stream edges in which to bury themselves.**	**Potential to occur. May pass through the reach of the Napa River in the project area from April to May to more favorable upstream habitat. Adult lampreys have been observed in the Napa River and infrequently collected during DFG sampling (Wang 1996; MEC Analytical Systems 2000).**

[1]Bold text indicates species with the potential to occur in the proposed project Area

Table 4.2-7 (concluded)
Listed Fish and other Aquatic Organisms (Endangered, Threatened, Proposed, or Candidate) with Potential to Occur in the Vicinity of the Napa Plant Site Restoration Project[1]

Scientific Name	Common Name	Fed/State/CNPS Status	Preferred Habitat	Likelihood of Occurrence in the Project Area
Lampetra tridentata	**Pacific lamprey**	**SC/--/--**	**Commonly occupy sand, gravel, and rubble; ammocoetes favor sand/mud substrate; adults favor coarser gravel-rubble substrate for spawning.**	**Potential to occur. May pass through the reach of the Napa River in the project area to more favorable upstream habitat. There are no known occurrences in the project vicinity.**
Pogonichthys macrolepidotus	**Sacramento splittail**	**SC/SSC/--**	**Backwater sloughs of major rivers.**	**Potential to occur. Fagan Slough and the barge channel provide suitable habitat. The nearest occurrence is located 1.6 mi. S of the project site in a tributary channel to Pond 2A of the Napa-Sonoma Marshes Wildlife Area (CNDDB 2005). Splittail were one of the most abundant species collected in gill net seining of Pond 3 at the NSMRP semiannual surveys in July 2004 and January 2005 (Takekawa et al. 2005). This species was also caught during the NRFMP surveys in 2004 approximately 2.6 mi N of the project site (NRFMP 2004).**
Spirinchus thaleichthys	**Longfin smelt**	**SC/--/--**	**Occupy middle/bottom of the water column in salt or brackish water; spawn in rivers and dead-end sloughs in fresh water, over sandy-gravel substrates, rocks, and aquatic plants.**	**Potential to occur. Napa River provides suitable habitat. The nearest known occurrence is located approximately 2.6 miles north of the project site on the Napa River (NRFMP 2004).**

Bold text indicates species with the potential to occur in the project Area
E – Endangered under the Federal or State Endangered Species Act
T – Threatened under the Federal or State Endangered Species Act
P – Proposed for federal listing status under the Federal Endangered Species Act
C – Candidate for listing status
SC – Federal species of concern
SSC – California species of special concern
Source: NSMRP EIR, USFWS species list, and CNDDB search for nine quadrangles surrounding the project area.

[1]Bold text indicates species with the potential to occur in the proposed project area

- **Delta Smelt.** Delta smelt is federally listed as threatened (58 Federal Register 12854, March 5, 1993), and its critical habitat was designated on December 19, 1994. Delta smelt critical habitat includes the following geographic areas: areas of all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker Bays); the length of Goodyear, Suisun Cutoff, First Mallard (Spring Branch), and Montezuma Sloughs; and the existing contiguous waters contained within the Delta. DFG surveys collected Delta smelt at a moderate level in both the open water and the beach surveys. Delta smelt typically occupy open surface water habitat with salinities lower than 12 ppt, and they move toward the shallow edge waters and slow-moving sloughs to spawn. Delta smelt have been captured in the 20-mm surveys conducted by DFG in the Napa River from 1995 through 2001, with the exception of 1997 when delta smelt apparently were absent. Three individuals were collected over a 4-year period at the Pond 2A restoration project (MEC Analytical Systems 2000). [No Delta smelt were captured by the NRFMP in 2004 (NRFMP 2004).]

- **Steelhead.** The Napa River has historically sustained runs of steelhead (NRFMP 2004). The nearest occurrence of Central California coast steelhead is located in North Slough at the culvert crossing with Eucalyptus Dr. 0.3 mi E of the project area (CNDDB 2005). [In 2004, the NRFMP captured two steelhead: one in marsh habitat approximately 2.6 miles north of the project site and one in open water habitat approximately 3.4 miles north of the project site (NRFMP 2004). These fish were likely steelhead from the central California coast steelhead or Central Valley Evolutionarily Significant Units. Central Valley steelhead is federally listed as threatened (63 Federal Register 13347, March 19, 1998) and is a California species of special concern. Central California coast steelhead is also federally listed as threatened (62 Federal Register 43938, August 18, 1997) and is a California species of special concern.]

  Central Valley steelhead use San Pablo Bay as a migratory route. Central California coast steelhead spawn and rear in the Petaluma River, Sonoma Creek, and Napa River and are present in San Pablo Bay near the mouths of these systems between October 1 and June 15 (USFWS 1993; Stern, pers. comm., 2005).

- **Chinook Salmon.** Chinook salmon use San Francisco Bay as a migratory corridor as they move from freshwater to the ocean as juveniles and from the ocean to freshwater as adults. Adults generally use deeper channels, whereas juveniles are more likely to use shallow habitats, including tidal flats, for feeding and as refuge from predators. Chinook salmon have been collected approximately 2.6 miles north of the project area in the Napa River (NRFMP 2004).

  Three runs or Evolutionary Significance Units (ESUs) of Chinook salmon have potential to occur in the Napa River system including the Central Valley spring and fall/late fall runs and the Sacramento River winter run. Critical habitat has been designated to include San Francisco Bay north of the San Francisco–Oakland Bay Bridge for the Sacramento River winter-run ESU (58 Federal Register 33212, June 16, 1993). Critical habitat for the Central Valley fall/late fall run ESU is a candidate for federal listing, but has not yet been designated.

- **Sacramento Splittail.** [The Sacramento splittail was removed from the list of threatened species by the USFWS on September 22, 2003 (NRFMP 2004).] No critical habitat has been designated for this species. Splittail is typically found in shallow water. The nearest known occurrence from 2001 is located in the tributary channel to Pond 2A of the Napa-Sonoma

Marshes Wildlife Area between South and China Sloughs (CNDDB 2005). Splittail was infrequently collected in the DFG open-water and beach surveys but was regularly collected during the Pond 2A restoration project (MEC Analytical Systems 2000). The species is known to occur in the Napa and Petaluma Rivers and Petaluma Marsh (USFWS 1993, 1996) near the Petaluma River, Novato Creek, and South of the SR 37 complexes. [In 2004, 326 splittail were captured by the NRFMP. Splittail were caught during all sampling months (March through July) and in all habitat types, including open water, marsh plain, and the South Wetlands Opportunity Area (i.e., restored marsh and floodplain) with the use of beach seine, fyke net, and otter trawl (NRFMP 2004).] Splittail were one of the most abundant species collected in gill net seining of Pond 3 at the NSMRP from semiannual surveys in July 2004 and January 2005 (Takekawa et al. 2005).

4.2.5 Impacts and Mitigation

4.2.5.1 Methodology and Significance Criteria

The following standards of significance are based on CEQA Guidelines, Appendix G. For purposes of this EIR, the proposed project may have a significant adverse impact on biological resources if it would:

- Result in the permanent loss of occupied special-status species habitat for any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the DFG or USFWS; or
- Result in the "take" (defined as kill, harm, or harass) of any listed threatened or endangered species or the habitat of such species; or
- Result in substantial reduction in local population size attributable to direct mortality or habitat loss, lowered reproductive success, or habitat fragmentation of plant species; or
- Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the DFG or USFWS; or
- Result in a substantial adverse effect on state or federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
  - substantially decrease the acreage or quality of intertidal and subtidal aquatic habitats,
  - substantially decrease the acreage or quality of tidal or nontidal wetlands,
- 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;
  - substantially decrease the acreage or quality of waterfowl breeding or wintering habitat,
  - substantially decrease the acreage or quality of migrant and wintering shorebird habitat, or
  - substantially interfere with anadromous fish passage

- Conflict with any locally applicable policies protecting biological resources; or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other applicable HCP.

4.2.5.2 Impacts and Mitigation Measures

Implementation of the proposed project or project alternatives has no potential for significant negative impacts on the following areas:

The majority of the project area does not provide habitat for vascular plants because of the hypersaline environment and prolonged period of inundation. Therefore, impacts associated with the project and project alternatives would not negatively influence existing plants population dynamics. Implementation of the proposed project may reduce habitat fragmentation and increase plant reproductive success.

No HCP, NCCP, or other local provisions protecting biological resources pertain to the project site. Therefore, the proposed project and project alternatives would not conflict with any locally applicable policies or plans protecting biological resources.

The proposed project would not adversely impact acreage or quality of waterfowl breeding or wintering habitat, or acreage or quality of migrant and wintering shorebird habitat. Implementation of the proposed project would substantially increase the acreage and quality of habitat for migratory waterfowl and shorebirds. The USGS (USGS 2005) avian surveys indicate limited use of the existing site by waterfowl and shorebirds. Limited use is attributed to hypersaline conditions and lack of suitable prey species. The tidal portions of the proposed project would provide significant open water habitat for waterfowl during high tide and intertidal mudflat for shorebird foraging during low tide in the first 10-20 years after breaching. As the proposed project area becomes vegetated waterfowl and shorebird use would likely decrease. The managed pond would provide protected foraging, nesting and roosting habitats for waterfowl and shorebirds during migration.

These issues are not addressed further in this section.

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

Biological resource impacts 1a, 1b and 1c pertain to permanent loss of habitat and "take" of special-status plants (1a), wildlife (1b) and aquatic resources (1c), respectively**.**

Impact to special-status plant species (BIO-1a):	The proposed project could result in permanent loss of habitat or direct "take" of special-status plant species identified in local and regional plans, policies, or regulations by the DFG and USFWS. Specifically, permanent loss of habitat or direct "take" of individual species listed in Table 4.2-4 could result if the proposed project is implemented.
Significance:	Potentially significant

Mitigation BIO-1a: Pre-construction surveys for special-status plant species will be conducted in areas that will be disturbed by construction activities. The pre-construction surveys will be conducted during suitable identification season(s) and within 1 year of the construction activities. If special-status plant species are observed they will be avoided if at all possible.

Residual Significance: Less than significant

Impact Analysis Discussion: Implementation of the proposed project could result in loss of special-status plant species and their associated habitats, however the area of potential impact is small. Special-status plant species that may be impacted by project activities include, but are not limited to, those species listed as "potential to occur" in Table 4.2-4 such as Mason's lilaeopsis, Delta tule pea, and Suisun marsh aster. Pre-construction floristic surveys will be conducted as described in the mitigation measure.

Direct impacts that may result in loss of special-status plant species habitat include breaching, lowering and construction of levees, and installation of water control structures. Channel breach locations will be modified to avoid special status plants if at all possible. Breach widths identified in the conceptual design range from 130 feet to 660 feet, Table 2-5. Breach locations in the North and Central Units were surveyed for Mason's lilaeopsis in November 2005. No Mason's lilaeopsis was observed at the breach locations, but was identified on the river-side of the Pond W1 levee. This population of Mason's lilaeopsis will not be directly disturbed by the project. Delta tule pea and Suisun marsh aster could occur in high marsh where levees will be breached to W1 or CB8.

Indirect impacts to special-status plant species habitat may result from development and expansion of tidal channels including: widening of Fagan Slough, which would be caused by reintroduction of tidal action to the North Unit; and erosion of small patches of tidal marsh outboard of the breaches in CB8 and W1. No mitigation is proposed for the indirect impacts, i.e. sloughing-off of blocks of marsh as Fagan Slough widens.

Project Benefits: The proposed project would restore large areas (969 acres) of tidal marsh habitat. During the early stages of marsh evolution (see Section 2.2.1.1) the proposed project would increase habitat for low marsh-dependent plant species such as cordgrass. As the marsh plain develops, suitable habitat would evolve for high marsh-dependent plant species. These areas could provide suitable habitat for tidal marsh-dependent species such as soft bird's-beak, which may colonize the site from populations in Fagan Marsh. Overall, implementation of the proposed project could result in a net beneficial impact to special-status plant species.

Impact to special-status terrestrial wildlife species (BIO-1b): Implementation of the proposed project could result in temporary loss of habitat provided to special-status terrestrial wildlife species identified in local and regional plans, policies, or regulations, or by the DFG and USFWS. Specifically, permanent loss, substantial reduction or direct "take" of individuals or habitat for the species listed in Table 4.2-5 including salt marsh harvest mouse, California black rail, California clapper rail, and western snowy plover

could result if the proposed project is implemented.

Significance: Potentially significant

Mitigation BIO-1b: Unavoidable impacts will require incidental take authorization from USFWS and DFG. Proposed mitigation measures include:

1. Conducting pre-construction breeding season surveys for California clapper rail, black rail, salt marsh common yellowthroat, San Pablo song sparrow, western snowy plover, and western burrowing owl in appropriate on-site habitat that may be affected by construction (including buffer zones e.g., southern portion of Fagan Marsh).
2. Avoiding work in occupied habitat during breeding/nesting periods, as defined in Table 4.2-8.

Table 4.2-8
Breeding Seasons and Construction Buffers for Special-Status Species

Species	Breeding Season	Construction Buffer (distance from nesting location)
western burrowing owl	February 1 through August 1	250-foot buffer for occupied burrows
California black rail	February 1 through August 1	250 feet
California clapper rail	February 1 through August 31	700 feet
Salt marsh common yellowthroat	April 15 through June 15	100 feet
San Pablo song sparrow	April 1 through August 31	100 feet
western snowy plover	February 1 through August 1	250-foot

3. Conducting construction worker “tail-gate” training, and
4. Providing an onsite biological monitoring during construction activities in potentially occupied special status species habitat, such as salt marsh harvest mouse habitat

.

Residual Significance: Less than significant

Impact Analysis Discussion: Implementation of the proposed project could result in permanent loss of special-status terrestrial wildlife species and their associated habitats by directly disturbing tidal marsh, salt pond and upland habitats. Special-status terrestrial wildlife species that may be impacted by project activities include, but are not limited to, those species listed as

"potential to occur" in Table 4.2-5 such as salt marsh harvest, western snowy plover, and black rail. Special-status terrestrial wildlife species habitats may be directly disturbed as a result of the project activities including excavation of tidal channels; breaching, lowering and construction of levees; and installation of water control structures.

Western snowy plover is the only special-status terrestrial wildlife species known to occur on the project site. Two western snowy plovers were observed resting on levees in the project area (USGS 2005). Internal levee grading and excavation of tidal channels has the potential to impact western snowy plover resting habitat. No rails have been observed on the project site, however black rails known to occur in Fagan Marsh could potentially be impacted by construction in the North Unit. California clapper rails were not detected during 2005 surveys in Fagan Marsh (Herzog et al. 2005). Potential indirect impacts to special-status terrestrial wildlife habitat include those discussed in BIO-1a. Mitigation measures will be implemented to avoid or minimize the effects of direct impacts.

Project Benefits: The proposed project would create tidal marsh and managed pond habitats. Tidal marsh and managed pond have the potential to provide habitat for a variety of special-status wildlife species. Restoration of 969 acres of tidal marsh would provide opportunities for a variety of terrestrial wildlife species to forage, breed, nest and rear young that would otherwise not be possible in the existing condition. Special status wildlife that may benefit from the restoration include: California black rail, California clapper rail, tricolored blackbird, San Pablo song sparrow and salt marsh common yellowthroat. In the long term the project area may provide dense high marsh, the preferred habitat for the Suisun ornate shrew and the salt marsh harvest mouse. The proposed project would have a net beneficial impact by creating habitat for multiple special-status species. Moreover, the proposed project may have substantial benefits to local wildlife populations by increasing tidal marsh habitat and reducing habitat fragmentation, e.g. restoration in the North Unit reconnects it to Fagan Marsh. The project site is a link in an expanding wildlife corridor located on both sides of the Napa River, extending from Highway 37 on the south to John F. Kennedy Regional Park in Napa.

Impact special-status aquatic species (BIO-1c):	Implementation of the proposed project could result in the direct "take" of special-status aquatic species identified in local and regional plans, policies, or regulations by the DFG and USFWS (Table 4.2-7). Specifically, construction of levee breaches and operation of the managed pond may result in a significant impact to native resident and migratory fish through direct "take," entrapment or adverse water quality conditions.
Significance:	Potentially significant
Mitigation BIO-1c:	An incidental take authorization may be required from USFWS and NOAA Fisheries for impacts to special status species for construction within the waters of the U.S., as well as operation of the managed pond (due to potential entrapment and adverse water quality). Mitigation measures to minimize the potential for entrapment and adverse water quality resulting from constructing levee breaches and

managed ponds will be developed in consultation with USFWS and NOAA-Fisheries. The managed pond water control structures will be operated to minimize fish entrapment. The DFG will have two management options: (1) to close the water control structures seasonally during peak juvenile anadromous fish migration (1 December-30 April), or (2) to maintain a flow-through condition in the managed pond.

Residual Significance: Less than significant

Impact Analysis Discussion: Implementation of the proposed project could result in "take" of special-status aquatic organisms. Special-status fish species that may be impacted by project activities include, but are not limited to, those species listed as "potential to occur" in Table 4.2-5 such as steelhead, Delta smelt and Sacramento splittail. These species are known to occur in the Napa River in the vicinity of the project area (NFRMP 2004). Special-status aquatic organisms may be impacted by work in Waters of the U.S. including, but not limited to, placement of cofferdams and construction of levee breaches and water control structures. Mitigation measures such as breaching levees outside of the anadromous fish migration periods, restricting placement of cofferdams to low tides, or using block nets or other migration barriers will be implemented as directed by NOAA Fisheries.

Operation of the managed pond could adversely affect special-status aquatic organisms. Increased predation of fish species could occur because the managed pond could enhance the quality of the foraging habitat for piscivores (fish-eating birds). Entrapment would occur when fish swim into the managed pond through the water control structures and then are unable to identify the exit location(s) or are physically prohibited from exiting the managed pond area. The potential for entrapment in the managed pond would be minimized by (1) closing the water control structures to the managed pond during peak juvenile anadromous fish migration (1 December-30 April), or (2) maintaining a flow-through condition in the managed pond during this period.

The potential water quality impacts to special-status species are discussed in Section 4.7 WA/SED-1 through WA/SED-6.

Project Benefits: The proposed project would provide a net beneficial effect for an array of fish and aquatic species that potentially include special-status species such as steelhead, Delta smelt and Sacramento splittail. Impacts to fish will be offset by the restoration of tidal marsh and a large channel network including both intertidal and subtidal reaches that may provide rearing habitat for salmonids and spawning habitat for Sacramento splittail as well as habitat for other aquatic species.

Impact to sensitive natural communities (BIO-2): Implementation of the proposed project could impact up to 5 acres of sensitive natural communities.

Significance: Less than significant

Mitigation: No mitigation required

Impact Analysis Discussion: The proposed project would result in direct impacts of up to 5 acres of vegetated wetlands within the project area, and indirect impacts to tidal marsh along Fagan Slough. These wetlands include some sensitive natural communities. "Sensitive natural communities" are those that are designated as rare and worthy of consideration on the *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003). The sensitive natural communities that could be disturbed during the implementation of the proposed project include Bulrush Marsh at the proposed breach locations adjacent to W1 and CB8; Brackish Cattail Marsh and Alkali Bulrush along Fagan Slough; and Pickleweed Wetland near the proposed location of the water control structures in the north end of the managed pond, and the breach at Pond 9.

The proposed project would not affect any riparian habitat.

Project Benefits: Implementation of the proposed project would restore over a thousand acres that would be potentially suitable for establishing the sensitive natural communities listed above. As the marsh plain develops within the project site the area available for dispersal, colonization and reproduction of these sensitive natural communities would increase by over 150-fold compared with their current area.

Impacts to wetlands (BIO-3):	Implementation of the proposed project would result in impacts to state or federally protected wetlands as defined by Section 404 of the Clean Water Act including shallow subtidal waters, intertidal mudflat, and tidal marsh habitats.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Construction activities that may cause direct impacts to wetlands include, but are not limited to, breaching external levees, levee improvements, installation of water control structures, realignment of the site access road and public access improvements. Specifically, direct impacts may include placement of fill in seasonal wetlands for grading and site improvements, and excavation in tidal habitats to construct breaches and water control structures.

Implementation of the proposed project may result in direct and indirect impacts to:

- shallow subtidal waters in the barge channel (1,800 feet from breach to river),
- intertidal mudflat between breaches and the low flow channel of the Napa River: 3,300 feet in Fagan Slough; 1,500 feet outboard of CB8, and 1,700 feet outboard of B-3
- tidal marsh in multiple locations with a sum of less than 5 acres associated with breaching levees, installing water control structures and levee lowering,
- less than one-tenth acre of seasonal wetlands near the northern water control structure in the managed pond

Indirect impacts to wetlands include scour or erosion (caused by tidal exchange) of intertidal mudflat outboard of CB8 and B-3 and potential scour of intertidal mudflat and tidal marsh habitat along Fagan Slough. The magnitude of these changes can be estimated by analyzing the historic conditions. For example, the historic channel that crossed the mudflat directly south of CB8 had a top width that ranged from 130 to 600 feet, with an average width of approximately 250 feet (Figure 1-2). This channel had a drainage area similar to the proposed project. Because the marsh area has subsided, the tidal prism at the time of breaching will be larger than the historic condition. Therefore, when the levee is breached near CB8 the channel that will form in the outboard mudflat would presumably be larger than the historic condition. As the marsh plain develops the channel cross-section would narrow to approximately the area of the historic condition because of the similar drainage area. It is difficult to assess whether the entire outboard mudflat (as opposed to the immediate channel area) would lose sediment to the restoration area.

Although wetlands and waters subject to Section 404 Clean Water Act jurisdiction may be impacted and there would be habitat type conversions (e.g. wetlands to waters or intertidal to subtidal) no net loss would be associated with these impacts. In addition, lowering of internal pond levees would increase total wetland area and compensate for new fill.

Project Benefits: Although the proposed project would result in conversion of some tidal habitat types, there would be no net loss of aquatic habitat acreage or quality. Additionally, the proposed project would result in the restoration of over 1,000 acres of tidal habitats (including tidal marsh and tidal channels, Table 2-2). Therefore, the proposed project's effects to federal and state regulated wetland are clearly beneficial.

Impact to anadromous fish passage (BIO-4):	Implementation of the proposed project may interfere with anadromous fish passage by causing entrapment or increased predation.
Significance:	Potentially significant
Mitigation BIO-4:	Same as BIO-1c
Residual Significance:	Less than significant

Implementation of the proposed project, including construction activities and operation of managed ponds may result in impacts to native resident or migratory fish similar to those described in BIO-1c. Therefore, the same mitigation measures are proposed.

Project Benefits*:* Tidal portions of the proposed project area would provide access to foraging and rearing habitat for native resident and migratory fish. This habitat is not currently provided by the salt ponds. Impacts to fisheries associated with the managed pond would be outweighed by the habitat benefits of the tidal channel network and associated marsh plain.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Biological resource impacts and mitigation for Alternative 1 are essentially equivalent to the proposed project, with the exception of BIO-1c and BIO-4. Because there is no managed pond in this alternative the potential impacts to special-status aquatic organisms and anadromous fish would be less than significant. Alternative 1 would also have slightly less potential for affecting

special-status plant and terrestrial wildlife species, sensitive natural communities and wetlands than the proposed project because there would be no construction of the water control structures associated with the managed pond.

Alternative 1 would provide greater benefits to tidal marsh-dependent wildlife species than the proposed project because of the larger area (an additional 191 acres) of tidal marsh.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Impacts and mitigation for Alternative 2 are essentially equivalent to the proposed project. Alternative 2 would not require breaching of the levee at W1, improving the levees around the Central Unit, or realignment of the site access road. Therefore, Alternative 2 would have slightly less potential for impacting special-status plant and terrestrial wildlife species, sensitive natural communities and wetlands than the proposed project. Because Alternative 2 would not require breaching of the levee at W1 there would be slightly less potential impacts on aquatic organisms than the proposed project during construction.

Beneficial effects for special-status species would be similar to the proposed project. Alternative 2 would restore less habitat for tidal marsh-dependent species, but more habitat for open water and/or mudflat-dependent species, e.g. shorebirds and waterfowl because the Wash Ponds would be managed as playa habitat.

ALTERNATIVE 3 – NO PROJECT

The No Project Alternative would not likely result in:

- the permanent loss of special-status plant and terrestrial wildlife or their habitat
- special status aquatic species or their habitat
- interference with the movement of any native resident or migratory fish
- impacts to sensitive natural communities or state or federally protected wetlands

Under current conditions very little habitat is suitable for special-status species. Natural levee breaches are unlikely to occur because the perimeter levee is very substantial. However, if emergency levee repair operations become necessary, special-status species may be impacted. DFG would comply with Clean Water Act permitting requirements associated with levee maintenance.

Over time the salt ponds may provide limited functions and values that are not currently afforded in the existing conditions. However, this process will be much slower than the proposed project or other alternatives.

4.3 CULTURAL RESOURCES

4.3.1 Sources of Information

A portion of the following background has been modified from the NSMRP EIR (CSCC and CDFG 2004) and the Cultural Resources Technical Report for the Napa Salt Marsh Restoration Project (CSCC and USACE 2003), with changes and input from URS Corporation and JRP Historical Consulting.

4.3.2 Regional Setting

San Pablo Bay and surrounding marshlands and uplands were used extensively by humans during prehistoric and historic times. For several thousand years during prehistoric times, the Coast Miwok and the Patwin Indians lived in areas surrounding San Pablo Bay. These native cultures subsisted on hunting, gathering, and fishing in San Pablo Bay, bay margins, and uplands. Settlement by Europeans in the late 1700s and early 1800s, and subsequent introduction of exotic diseases, adversely affect these native peoples. Their populations were decimated by the early 1900s.

Early European settlement of Napa County led to large land grants and new land uses. The San Pablo Bay tidelands remained undeveloped for the 1850s and 1860s but were transformed in the 1870s with the reclamation of much of the tideland under the 1868 Green Act. By the early 20th century levees enclosed nearly all of the San Pablo Bay marshes (Hayes 1995; Kelley 1989). New land uses included ranching, duck hunting, urban infrastructure such as roads, and salt production.

At the time of Euroamerican contact, the Patwin lived in the proposed project area; the Patwin spoke Suskol. Native American archaeological sites in the vicinity of the proposed project tend to be situated along the bases of hills and alluvial flats, in areas along the edge of the marsh/slough system.

4.3.3 Environmental Setting

4.3.3.1 Paleoenvironment

Central California was subjected to a series of climatic fluctuations over the past several millennia. Generally warm/dry episodes were interspersed with intermittent cool/moist periods (Moratto et al. 1978). The Altithermal Period (a warm/dry episode) ended approximately 2,900 years ago, leading to changes in animal and plant populations and distributions. A subsequent climatic cooling trend characterized the next 1,400 years, which was then somewhat abruptly replaced by climatic warming, which continues to the present. Following the introduction of livestock by Euroamericans the abundant and widespread native grasslands of central California were replaced by the nonnative species that dominate today. It is thought purple needlegrass (*Nassella pulchra*), a bunchgrass found only in California, may have been the dominant species.

4.3.3.2 Prehistory

The Cultural Resources Inventory and Evaluation Report for the Napa Salt Marsh Restoration Project (CSCC and USACE 2003) provides a summary of the prehistory of the Patwin ethnographic group, who lived in the proposed project area.

> Patwin territory included the lower portion of the west side of the Sacramento Valley west of the Sacramento River from about the location of the town of Princeton in the north to Benicia and the Napa River in the south (Johnson 1978:350). In this larger territory, the Patwin traditionally have been divided into River, Hill, and Southern cultural/geographic groups, although in actuality a more complex set of linguistic and cultural differences existed than is indicated by these three divisions (Johnson 1978:350). The Patwin language contains numerous dialects that belong to the Wintu family of the Penutian language stock (Shipley 1978:82–83). The Patwin were bounded to the north, northeast, and east by other Penutian-speaking peoples (the Nomlaki, Wintu, and Maidu, respectively) and to the west by the Pomo and other coastal groups. Near the proposed project area, the Patwin are believed to have reached the Carquinez/Suisun area by approximately 1500 BP (Whistler 1979; McCarthy 1985).
>
> The main tribelet in the vicinity of the proposed project area was the Aguasto group, who inhabited the eastern portion of the Napa River on the northeast side of San Pablo Bay (Johnson 1978: 350).
>
> Patwin villages contained four types of permanent structures, which were earth covered, semi-subterranean, and either elliptical or circular in shape. The structures are the family or dwelling house; the ceremonial dance house, which was built at the north or south end of the village; the sweathouse, positioned east or west of the sudatory; and the menstrual hut, which was placed at the village edge farthest from the dance house (Johnson 1978:357–358).
>
> Patwin subsistence consisted of hunting and gathering from a village base. Acorns were a staple food that the Patwin gathered from two types of valley oak, hill oak, mountain oak, and (rarely) live oak. Acorns were pulverized with a long river cobble pestle (Merriam 1967) in wooden mortars (Johnson 1978:357). The acorns were then leached in a sand basin and made into a bread or soup. Acorn soups were heated in a basket by boiling with cooking stones. Acorn bread was baked in an earthen pit oven lined with leaves. The Patwin also gathered buckeye, pine nuts, juniper berries, manzanita berries, blackberries, wild grapes, Brodiaea bulbs, and tule roots. Bulbs were removed from the ground with wood digging sticks and then baked or boiled; berries were eaten raw, dried and pulverized, or boiled (Johnson 1978:355). Tobacco was gathered along watercourses but was not cultivated (Powers 1874; Kroeber and Heizer 1932).
>
> The Patwin probably first encountered Europeans during Spanish domination of California. At least by 1800, Spanish missionaries from Mission Dolores (San Francisco de Asís) recruited neophytes from the

> Patwin villages of Aguasto and Ululato, both within 12 miles of the proposed project area (Bennyhoff 1977 [1961]). Neophytes were recruited for mission labor from other Patwin settlements as well, until the secularization of the missions by Mexican government in 1834 divided the mission lands into individual land grants (Johnson 1978:351).
>
> Under Mexican rule in California, the Patwin suffered from numerous military incursions and attacks from Mexican and American settlers who occupied Patwin territory as a result the Mexican government's liberal land grant policy. Some settlers and military officers, such as George C. Yount and General Mariano G. Vallejo, enlisted Indian aid against other Indians "who stole or promoted violence" (Johnson 1978:351). The Patwin also suffered from epidemic diseases, such as malaria and smallpox, which led to a decline in the Patwin population. (Johnson 1978:351–352).

The U.S. conquest of California (1846–1848) was followed by a massive influx of American settlers into Patwin territory, increasing pressure on the indigenous population. To facilitate the development of ranching, agriculture, mining, and large settlements, American policy toward the Patwin was generally one of removal to reservations. Some Patwin adjusted to American dominance by working on ranches (Johnson 1978:351–352). Estimates of recent Patwin population are very low; the U.S. Bureau of Indian Affairs reported 11 Patwin in 1972 (Johnson 1978). However, such estimates often include only Patwin with one-quarter or more descent (as in Kroeber and Heizer 1970), excluding those persons with less than one-quarter Patwin descent. Elements of Patwin culture may be preserved in contemporary Indian cultures by way of pan-Indian organizations and living descendants of the Patwin (Castillo 1978).

4.3.3.3 Restoration Area Archaeology

An archaeological records search was conducted by URS Corporation on May 25, 2005 (Northwest Information Center File Number 04-1066). No archaeological sites have been recorded in the vicinity of the restoration area of potential effects (APE); one known archaeological site has been recorded within the proposed project area. Several cultural resources studies have been conducted in the area surrounding the proposed project area, including reports produced by Fredrickson (1967, 1974, 1975, 1983), Moratto (1974), Rudo (1980), Baker (1986), Peron (1989), Mikkelsen et al. (1991), Chavez (1990), Jackson (1978), Archaeological Consulting and Research Services (n.d.), Flynn (1988), Flynn et al. (1983), Jordan and Carrico (2001), and CSCC and USACE (2003).

Aside from CA-NAP-230, no prehistoric sites have been identified within a 1/2-mile radius of the restoration APE. Nels Nelson (1909), one of the pioneers of early scientifically based archaeology, first identified NAP-230 in the early 20th century. CA-NAP-230, within the APE, consists of the remains of numerous shell fragments and obsidian flakes on the northwest edge of Green Island. This site may be associated with the ethnographic village of *Aguasto* (Bennyhoff 1977 [1961]).

On April 6, May 26, and October 26, 2005, archaeologists from URS Corporation conducted an archaeological survey of the proposed project area. Historical Architects from JRP Historical Consulting Services (JRP) visited the site separately in April and May 2005, and they

photographed buildings and structures in the proposed project area. During the site visit two archaeological deposits were noted, and JRP is currently preparing an inventory of historic resources that appear to be more than 50 years old. These resources are in the process of being recorded on Department of Parks and Recreation 523 forms. These forms and the results of the technical reports are not included in this draft of the baseline conditions section.

Qualified archaeologists conducted a sample survey of accessible locations within the restoration APE during the site visits in May 2005. Two archaeological deposits were observed during the site visit: CA-NAP-230 and an unrecorded historic archaeological site associated with the burned remains of a homestead building on Green Island; however, a formal archaeological survey of the restoration APE was not conducted because the majority of the proposed project area is completely inundated and levees are not part of the natural environment. The two archaeological sites were identified on an area of Green Island that will not be disturbed under any of the alternatives to the proposed project.

As noted above, archeological surveys identified prehistoric and historic archaeological deposits on Green Island. Neither of these sites has been formally evaluated for eligibility to the California Register of Historic Resources (CRHR) or the National Register of Historic Places. Both sites appear to have been highly disturbed or largely removed as a result of subsequent activities at Green Island. These sites are outside the APE for this proposed project, as no project-related activities under any of the alternatives under consideration would occur in this area. The results of the archaeological survey are detailed in Appendix D. Because archaeological data are considered sensitive, this appendix is considered confidential and available on a need to know basis.

Native American Consultation Efforts

The California Native American Heritage Commission was contacted to seek information pertinent to interested Native American individuals on May 20, 2005. The Commission did not have information in the sacred lands file for the proposed project area but provided a list of Native American individuals who may have knowledge of resources in the area. All of the individuals on this list were contacted in writing on June 1, 2005. To date only one response has been received from the Suscol Council; in a letter dated June 4, 2005, the Suscol Council requested that they be immediately informed of any discoveries of unknown archaeological deposits and be kept apprised of design plan changes.

4.3.3.4 Restoration Area History of the Built Environment

The native inhabitants of Napa Valley were known by various names in their earliest contacts with western culture, but during the Spanish period of occupation in the valley they became generally known as the Patwin Indians. Between 1823 and 1834, many were induced to move to Mission San Francisco de Solano at Sonoma where they worked in mission orchards, fields, pastures, and shops under the supervision of the padres. Others were drafted into the private labor force, working as migratory field hands, *vaqueros*, or household servants.

Napa Valley was once part of Alta California, an area claimed by the Spanish Empire. Spain lost Alta California to Mexico in 1821, when Mexico separated from its mother country. The newly independent Mexican government sent Padre Jose Altimira and Don Francisco Castro to select a

site suitable for a new mission north of Yerba Buena (San Francisco), because the Native American population, used to warm, dry weather, was suffering badly at Yerba Buena. After traveling through the Napa and Sonoma regions, they decided that Sonoma had more timber and water and, therefore, would be the best place for the new mission. Napa was determined to be more suitable for cattle tending (Weber 1998).

After the Mexican War, the U.S. military established the "District of Sonoma," which extended from San Francisco Bay to the Oregon border and from the Pacific Ocean to the Sacramento River and included Napa County (Weber 1998). Although not thoroughly explored by the Spanish and Mexicans, Napa Valley was one of the first areas to be settled by Americans, and was one of California's original 27 counties, founded on February 8, 1850. The county's boundaries were defined to include what are now Lake County and the American Canyon area. The town of Napa was named the county seat in 1850. The border with Solano County was redefined in 1852 and Lake County became a separate entity in 1861.

Several features checked Napa's growth. The most significant factor concerned who actually owned the land. The Treaty of Guadalupe Hidalgo stipulated that land belonging to Californios at the end of the Mexican-American War would remain in their possession. William Gwin, a newly elected senator from California, introduced a bill that put an end to the Mexican pastoral period and allowed for individuals who occupied land within ranchos to take possession of it so long as the area did not exceed 160 acres, had clearly marked boundaries, or had improvements to the value of $100. Squatters were thus guaranteed the right to possess whatever land they could keep. Nearly everyone who had received Spanish or Mexican land grants in Napa Valley had at least part of their ranchos claimed by squatters (Weber 1998).

Settlement

The property comprising the Leslie's Salt Company facility is located northeast of San Pablo Bay on the eastern bank of the Napa River. This portion of the valley remained relatively isolated until 1861. Land classified as swamp and overflowed land, and not within a rancho, was property of the state; upland areas were part of the federal public domain. In 1866 the state legislature gave the responsibility of overseeing the land's reclamation to the respective counties. An act to permit the acquisition of swampland was passed in 1868, adding the provision for establishing reclamation districts as well as placing no limits on the amount of land any individual might purchase. The act also stipulated that after 3 years of successful cultivation a purchaser would be credited the amount he paid for the land and be entitled to its patent. Three reclamation districts were formed in Napa County between 1861 and 1885, but none was still operating by 1930 (Bonte 1930).

Charles Broadwell and David Saunderson originally patented the land in the study area, as described in swamp and overflowed land location surveys. Several others had made earlier attempts to acquire portions of this land but never achieved patent. Swamp and Overflowed Lands Location Survey No. 31 was the first to be conducted, in 1856, at the request of Jacob Anderson, but did not result in a private patent until 1886 by David Saunderson by virtue of Reclamation District No. 472 (State of California 1886a). This land was described as located in Sections 8, 9, 15, 16, 17, 21, 22, and 23 in T4N/R4W, Mount Diablo Base and Meridian, and included "a small island containing sixteen acres" known as Green Island. Surveys 96½, 97, and 98 were conducted in 1861 on behalf of Jacob Anderson, and achieved patent in 1883 with

David Saunderson as patentee (State of California 1886b). Surveys 839 and 840 were conducted in 1876 for purchase by David Saunderson but were patented in 1893 by Charles E. Broadwell (State of California 1876). Patent was achieved for these parcels once the district reclaimed them to the state's satisfaction. Two individuals, Waldren and Pond, were listed as owners of the land on a county map dated 1876 with a total area of 1,092.53 acres (Lyman 1876). The 1895 county map depicted 1,088.16 acres in the study area as owned by Mary T. Lea et al. (Buckman 1895). Charles E. Broadwell maintained ownership of the southern portion of the area. By 1915 the property was listed under the ownership of J.W. Dutton (Buckman 1915).

By the late 19th century much of the marshland had been diked and drained and was being used for livestock grazing or cultivation of oats and hay. Assessor's returns for Napa County as a whole show that in 1871 107,650 acres were enclosed with 48,000 acres under cultivation and by 1872, 31,500 were in wheat and 3,725 in barley (Menefee 1873). The southern end of the county was mostly given to agricultural grazing land and orchards (Weber 1998). A General Land Office survey of the township in 1921 revealed that most of the land surrounding Green Island was under cultivation and protected by levees along the banks of the Napa River. The surveyor notes "a few spots of upland, the larger of which is an oval shaped hill reaching an elevation of about 25 ft. and known as Green Island," and that this above 30-acre portion is "returned as upland, and not subject to the 'Swamp and Overflowed' act by Congress in 1850." He also noted a well on this property, said to furnish excellent water. The soil in the township was described as generally "heavy adobe loam, 1st rate, and literally filled with the roots of the swamp growth, such as tules and salt grass." The surveyor also notes that the prevailing crop of the subject area was "small grain, moved by boat and barges to nearby markets at San Francisco, Oakland, and other towns along the water ways in the vicinity." The barges likely took cargo from Dutton's Landing, where a warehouse was located nearby, through the main river channel and out into San Pablo Bay (General Land Office Survey 1923). Navigation charts from the late 19th century show several sloughs around Green Island, but none were navigable by barge (Osborn 1897). The 1921 General Land Office survey also reported some families living at Brazos Station, on the Santa Rosa branch of the Southern Pacific Railroad. Brazos Station was located at the east end of the railroad bridge near the northern end of the study area (Joy 1921).

Transportation

The primary mode of transportation prior to the construction of the railroad in Napa County was the Napa River. In the Gold Rush days the only time the river could be forded was at low tide. William Russell built the first ferry across the river at the foot of Third Street in the town of Napa. A second ferry was constructed in 1852 in Suscol to serve the Petaluma-Sacramento stage. These ferries were to the north and outside of the study area; however, the Napa River did serve as a route for the region's early development. As the area grew, the river became severely polluted with waste dumped by the numerous industrial operations that lined its banks. A rock and gravel company had contracted to scoop out stones from the Napa River's bed to sell as street paving in San Francisco, which profoundly affected the river's health in the saltwater section (Weber 1998).

The railroad entered Napa County with the help of renowned entrepreneur and booster Sam Brannan, who wished to make his Calistoga resort more accessible to San Francisco patrons. In 1863 a group of San Franciscans, encouraged by Brannan, teamed to build a railroad from Vallejo to Calistoga. The venture never came to fruition, but shortly afterward Brannan was able

to persuade Chancellor Hartson, the new state senator from Napa, to introduce in the state legislation allowing the county to issue bonds to build the railroad. Voters approved $225,000 for a line to be laid between Suscol and Napa City. The citizens of Napa Valley were not interested in extending the railroad line to Calistoga, as Brannan had hoped, but the Napa Valley Railroad to Calistoga was nonetheless constructed using funds not spent on the Suscol-to-Napa line and substantial contributions from private individuals, who were later reimbursed. The final link of the Napa Valley Railroad was laid from Suscol to Adelante, thereafter called "Napa Junction" (Weber 1998). These lines, which were important to the county's development as a whole, did not traverse the study area; rather, they were located to the east of the study area.

In 1888 the Southern Pacific Company constructed a branch from its main Sacramento line in Napa to Santa Rosa via the Sonoma Valley. This line crossed the Napa River at Brazos Station, bypassed Sonoma, running along the west side of Sonoma Creek, and then continued on to Santa Rosa (Lynch n.d.). The bridge at Brazos is shown on a 1923 Government Land Office survey map as a swivel bridge. The bridge that now spans the river operates on a lift system. In the summer of 1959, Southern Pacific reported a train wreck at Brazos. Three cars fell into the river, leaving the caboose hanging off the edge, after the train was unable to stop before falling through the open draw (Percy 2005). This span of track is now referred to as the Northwestern Pacific Railroad line and is owned by Sonoma-Marin Rail Transit (SMART).

Recreation

Dutton's Landing resort was located just south of the Brazos drawbridge (presently the central unit of the NPSR project). The landing was a popular boating, hunting, and fishing destination and served the greater Napa community from the 1890s to 1962. The facilities featured a wharf and rental cabins, and during its heyday 200 or more sportsmen would gather there over a weekend. Leslie Salt Company purchased the property from the estate of Mr. Holland Dutton and his former wife, Dianne. The two lived in the house on Green Island and were known to hold lavish gatherings on their knoll. Dutton was institutionalized sometime in 1940 after experiencing an emotional collapse, excitedly warning officials at the courthouse that Japan was going to attack the United States. That same day he was found directing traffic in a navy commander's uniform. Dutton died that year at Napa State Hospital at the age of 44. Dutton's Landing was dismantled in 1962 (Ezettie 1967).

Salt

Prior to Leslie's establishment of the plant at Green Island, salt had not been produced in San Pablo Bay (Ver Planck 1958). California's salt industry started in 1856, when a small amount of natural salt appeared on the market. At that time, the demand for salt was relatively small. Although salted meat and fish were produced locally, the salt used for that industry was imported. Prior to this time Spaniards, Indians, and Mexicans gathered salt in the tidepools along the Alameda County shore. The Comstock Lode was the first spur to the California salt industry. Salt was used in the industrial Washoe process of treating silver ore. The meat- and fish-curing industry of San Francisco had used imported salt for its superior quality (Ver Planck 1958).

Leslie Salt Refining Company was established in 1901 and was one of the first to operate on the west side of San Francisco Bay. At this time three major companies were operating in the Bay Area: California Salt Company, Continental Salt and Chemical Company, and Leslie Salt

Refining Company. The companies began merging with smaller salt farms and buying production companies. In 1924, the three companies merged to form Leslie-California Salt Company. In 1936 Leslie Salt Company incorporated, acquiring the assets of Leslie-California Salt Company and Arden Salt Company. By 1959 the company operated ponds that covered over 40,000 acres that were expected to produce one million tons of salt a year (Ver Planck 1958).

Leslie's Salt Company acquired Dutton's farmland and Dutton's Landing and began installation of its salt facilities in 1952 although evidence suggests the resort was still in operation until 1962. Napa, according to George Lucas, the plant's first manager, was located as far north as it was economically feasible to salt-farm. The saltwater intake for the plant was located at Sears Point Road. The water was collected in Pond 1 and then circulated through a series of concentrating ponds, crossing various sloughs and siphons, until it reached Edgerly Island, where it was transported under the river by pipe and pumped into the ponds around Green Island. At this juncture the salinity reached a sufficient level of concentration. From there, the water was further processed in pickle ponds and crystallizing ponds. The water in these ponds was concentrated through evaporation until the raw salt reached 5 to 6 inches deep (Ver Planck 1958). It was then harvested (Dunn 1959).

Leslie Salt Company continued operations at the Napa plant until 1979, when Cargill, an agricultural product corporation, acquired the company. The brand name was retained for the product until 1991 when it was changed from Leslie to Cargill (Shilling Family Company 2005). Salt production ceased at the Napa Plant Site in the early 1990s, when the state took ownership of the portion of the salt production ponds on the west side of the river. The proposed project site was acquired by the state in 2003.

Built Environment Historic Land Ownership

The land that is the subject of this report was not part of any Mexican land grant. The property surrounding Green Island was swamp and overflowed land owned by the state until the 1860s, when it was transferred to private ownership for the purpose of reclamation. The Dutton family took possession of the property early in the 20th century and operated a farm and a recreational landing that served sportsmen in the greater Napa area. The Duttons sold the land comprising the proposed project area to Leslie Salt Company in 1952. All the buildings within the study area, except some of those on Green Island, relate to Leslie Salt Company's tenure. Ownership of the buildings was transferred from Cargill to the state in the acquisition of the site of the proposed project.

As Built Environment Resources

Most of the built environment resources that were recorded and evaluated by JRP are associated with the salt industry. An additional built environment feature within the proposed project area is a segment of the Northwestern Pacific Railroad line.

The buildings, structures, and features that collectively comprise the "Napa Site Facility" include:

- Barge dock with concrete platform
- A single-story building used as a Cargill Corporation office

- Corrugated metal warehouse
- Modern corrugated metal building north of warehouse
- 15 salt ponds separated by low-lying internal levees lined by posts and more substantial perimeter and interior levees with road access. Ponds are fed by slide-operated wooden control gates with levels regulated by pumping stations.
- Electric pump on the east side of the Napa River for control of brine flow into pickle ponds
- Wooden brine gates located at numerous spots throughout the pond area
- Wood plank bridge leading to the crystallizing ponds
- Wooden platform that supports a head gate to aid in controlling the flow of water from internal canals to the crystallizing ponds
- Segment of the Northwestern Pacific Railroad line

JRP has evaluated these built environment resources using the criteria for eligibility for listing in the CRHR (see below). JRP has concluded that the buildings and structures evaluated for this survey do not appear to meet the criteria for listing in the CRHR and, thus, do not appear to be historical resources for the purposes of CEQA. Refer to Appendix D for more detailed information on these built environment resources.

4.3.3.5 Paleontological Resources

Paleontological resources are the mineralized (fossilized) remains of prehistoric plant and animal organisms, as well as the mineralized impressions (trace fossils) left as indirect evidence of the form and activity of such organisms. The proposed project area encompasses few areas of undisturbed soils as the construction of the salt ponds and levee systems required extensive excavation and filling. To the west of the proposed project area is the Petaluma Formation (Late Miocene – Pliocene [10 to 14 million years ago]). It is differentiated from the Huichica Formation by source rocks and lithology, and is separated from the Huichica by wide valleys and faults. The Green Island area is part of the Huichica Formation. The Huichica Formation dates to the Plicoene epoch (1 to 13 million years ago). Although a variety of invertebrate fossils, such as brackish and freshwater mollusks, and Hemphillian to Blancan age vertebrate fossils, including rhino, mastodon, camel, horse, bison, and turtle, have been discovered in the lower to middle Petaluma Formation (Sims et al. 1973), documentation is lacking that indicates significant or unique paleontological finds associated with the Huichica Formation (Sims et al. 1973). A portion of the proposed project area (the water line at its east terminus) intersects the Domengine Formation. This formation dates to the Eocene epoch (38 to 56 million years ago). This formation contains abundant mollusks and other non-unique mollusks (Respess, pers. comm., 2005). Based on available data, the potential appears to be very low for significant *in situ* paleontological resources to be present within the proposed project area.

4.3.4 Impacts and Mitigation

4.3.4.1 Historical Resources Standards of Significance

For the purposes of this EIR the proposed project would have a significant impact on cultural resources if it would:

- Cause a significant adverse change in the significance of a historical resource as defined in CEQA Guideline Section 15064.5.

The standards of significance for historical resources are based on Appendix G and Section 15064.5 of the CEQA Guidelines. As currently worded in CEQA Guidelines Section 15064.5, historical resources include resources listed in, or determined to be eligible for listing in, the CRHR; resources included in a qualifying local register (such as the Napa Register of Historic Resources); and resources that the lead agency determines to meet the criteria for listing in the CRHR. These criteria may apply to any historic built environmental feature, and to historic or prehistoric archaeological sites. Properties or sites that are eligible for inclusion in the CRHR are termed "historical resources." Under the provisions of CEQA Guidelines Section 15064.5(a)(3), generally, a lead agency should find that a property is historically significant if it determines that it meets one or more of the criteria for listing on the CRHR, which extend to any building, structure, feature or site that:

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

With few exceptions, to qualify as an historical resource a property must be at least 50 years old and also must retain physical integrity and integrity to its period of significance. For historic structures and buildings, significantly altering the setting, remodeling, or moving the structure may diminish or destroy its integrity. However, under some conditions, a building that has been moved or altered may still retain its historic significance. Landscaping or landscape features may in some cases contribute to the significance of an historic architectural property. Such elements would be assessed as part of the evaluation of the related historic architectural property.

Archaeological sites may also qualify as historical resources under CEQA Guidelines Section 15064.5(a)(3). Archaeological sites most often are assessed relative to CRHR Criterion D (for potential to yield data important to history or prehistory). An archaeological deposit that has been extensively disturbed and archaeological artifacts found in isolation may not be eligible for listing on the CRHR, because the lack of stratigraphic context may reduce the potential for the resource to yield significant data. A resource that does not meet one of the criteria for eligibility to the CRHR is not an historical resource under CEQA, and impacts to such a property are not significant.

The standards of resource significance, and for significance of impacts, are defined by Public Resources Code (PRC) Section 5024.1, 14 California Code of Regulations (CCR) 4850, which establishes the CRHR.

For purposes of this EIR, impacts of the proposed project would be significant if they would cause substantial adverse change in the significance of one of the following:

- A historical resource (i.e., a cultural resource eligible for the CRHR)
- An archaeological resource (defined as a unique archaeological resource that does not meet CRHR criteria)
- A unique paleontological resource or unique geologic feature (i.e., where the proposed project would directly or indirectly destroy a site)
- Human remains (i.e., where the proposed project would disturb or destroy human remains, including those interred outside of formal cemeteries).

"Unique archaeological resources" are defined under CEQA through PRC Section 21083.2(g). A unique archaeological resource implies an archaeological artifact, object, or site about which it can be clearly demonstrated that a high probability exists that it meets one of the following criteria:

- The archaeological artifact, object, or site contains information needed to answer important scientific questions and public interest in that information is demonstrable, or
- The archaeological artifact, object, or site has a special and particular quality, such as being the oldest of its type or the best available example of its type, or
- The archaeological artifact, object, or site is directly associated with a scientifically recognized important prehistoric or historic event or person.

For a resource to qualify as a unique archaeological resource, the lead agency must determine that a high probability exists that the resource meets one of these criteria without merely adding to the current body of knowledge (PRC Section 21083.2(g)). An archaeological artifact, object, or site that does not meet the above criteria is a nonunique archaeological resource (PRC Section 21083.2(h)). An impact to a nonunique archaeological resource is not a significant environmental impact under CEQA Guidelines Section 15064.5(c)(4). If an archaeological resource qualifies as a historical resource under CRHR criteria, then the resource is treated as an historical resource for the purposes of CEQA.

CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. These procedures are detailed under PRC Section 5097.98. California Health and Safety Code Section 7050.5(b) prohibits disturbance of human remains uncovered by excavation until the coroner has made a finding relative to PRC Section 5097 procedures.

4.3.4.2 Analytical Method

Impacts to archaeological resources and human remains most often occur as a result of excavation or grading within the vertical or horizontal boundaries of a significant archaeological site. Archaeological resources may also receive impacts as a result of proposed project activity

that increases erosion, or increases the accessibility of a surface resource and, thus, increases the potential for vandalism or illicit collection.

Significant impacts to historic built-environment features (such as buildings, canals, bridges, and in some cases, associated landscaping) may result from demolition or physical alteration of the features. Significant impacts may occur if the setting of an historic structure or feature is altered by the introduction of incompatible elements, in cases where the property retains integrity of setting and the setting of the resource contributes to its significance.

Under CEQA Guidelines, a significant effect on paleontological resources can occur when a proposed project will "directly or indirectly destroy ...a unique paleontological resource."

The proposed project includes specific footprints and areas of disturbance for new or redeveloped facilities and related grading and excavations. The extent of ground disturbance anticipated for the proposed project is reasonably understood, and a qualified archaeologist who meets the criteria for the Secretary of Interior's Standards reviewed the proposed project plan in consultation with the Project Engineer.

In some cases, through consideration of cultural resources early in the planning process, it has been possible to redesign the proposed project to minimize or eliminate impacts on archaeological resources. Preservation in place is the preferred mitigation for impacts to archaeological sites that are historical resources (CEQA Guidelines Section 15126.4(b)(3)(A))

4.3.4.3 Impacts and Mitigation Measures

PROPOSED PROJECT– TIDAL RESTORATION AND MANAGED POND

CR-1: Impact to cultural resources	The proposed project would entail four levee breaches, construction of intake/outlet structures to provide for active management of one 175-acre managed pond, improvements to the perimeter levees, construction of a site access road along one of the levees connecting Green Island, and construction of water pipeline along Green Island Road Green Island and to the existing administrative building.
Significance:	Less than significant
Mitigation CR-1:	No mitigation required.

Impact Analysis Discussion: No mitigation measures for impacts to known cultural resources are required for the proposed project. If yet undiscovered cultural resources (historic or prehistoric artifacts, concentrations of shell, burnt or unburnt bone, stone features, etc.) are uncovered during grading or construction activities, work in the vicinity of the find will be halted and a qualified archaeologist will be consulted for an on-site evaluation. If human remains or suspected human remains are found on the site, work in the vicinity will halt, the remains will be protected from further disturbance, and the proposed project owner will immediately contact the Napa County coroner. If the coroner determines the remains are Native American and not under his purview, he will contact the Native American Heritage Commission as mandated by PRC

5097. The environmental inspector for the proposed project will be responsible for oversight and compliance with these provisions

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Cultural resource impacts for Alternative 1 are essentially equivalent to the proposed project. No mitigation is required.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Cultural resource impacts for Alternative 2 are essentially equivalent to the proposed project. No mitigation is required.

ALTERNATIVE 3 – NO PROJECT

No new construction activities or changes to the current management of the ponds would occur under this alternative.

4.4 GEOLOGY, SOILS, AND SEISMICITY

This section addresses the geologic environment of the proposed project site. It includes the baseline geologic, geomorphic, and seismic conditions. The potential geologic and seismic hazards are also discussed, as they might pertain to the site and the proposed restoration.

4.4.1 Sources of Information

The analyses and conclusions presented in this report were based on a review of USGS and California Division of Mines and Geology (now Geological Survey of California) maps and reports; published and peer-reviewed scientific literature, seismicity catalogs, and other available, nonproprietary geologic and seismologic data.

4.4.2 Regional Setting

4.4.2.1 Physiographic Setting

The San Francisco Bay area has a structurally controlled topography that consists primarily of north- to northwest-trending mountain ranges and intervening valleys that is characteristic of the Coast Ranges geomorphic province. This fabric is subparallel to the San Andreas fault. The Coast Ranges consist of the Mendocino Range to the north of San Francisco Bay, the Santa Cruz Mountains west of the Bay, and the Diablo Range to the east of the Bay. The Coast Ranges are composed of a thick sequence of late Mesozoic (200 to 70 million years old) and Cenozoic (less than 70 million years old) sedimentary strata. The northern part of the Coast Range is dominated by the landslide-prone Franciscan Formation.

San Francisco Bay is a topographic trough formed by a combination of warping and faulting and is underlain by a down-dropped or tilted block (the Bay Block) (Olson and Zoback 1998). The Bay is about 90 kilometers (km) long and from 5 to 8 km wide. Constrictions divide the Bay into Suisun, San Pablo, and North and South San Francisco bays.

4.4.2.2 Regional Geology

The geology of the Bay area is made up primarily of three different geologic provinces: the Salinian block, Franciscan complex, and the Great Valley sequence. The Salinian block is located west of the San Andreas fault. It is composed primarily of granitic plutonic rocks, which are similar to those found in the Sierra Nevada and are believed to be rocks of the Sierra Nevada Batholith that have been displaced along the San Andreas fault. To the east of the San Andreas fault and bounded on the west by the Hayward fault is the Mesozoic Franciscan complex. The Franciscan rocks represent pieces of former oceanic crust that have accreted to North America by subduction and collision. These rocks are primarily deep marine sandstone and shale. However, chert and limestone are also found within the assemblage. To the east of the Hayward fault is the Great Valley sequence, which is composed primarily of Cretaceous and Tertiary marine sedimentary rocks in the Bay area.

4.4.2.3 Recent Geologic History

The Franciscan Formation basement was originally above sea level and exposed to dissection by rivers and streams. As the basement began to subside between 1,000,000 and 500,000 years ago, the initial unit deposited on its surface was the Alameda Formation. Since the formation of the Sacramento-San Joaquin drainage outlet through San Francisco Bay approximately 400,000 years ago, the environment of deposition has fluctuated between estuarine (periods of high sea level resulting from a warm global climate) and alluvial (periods of low sea level during periods of cold global climate) (Sloan 1992).

The present Bay estuary formed less than 10,000 years ago as the global climate warmed and sea levels rose. Marine water reentered the Bay approximately 10,000 years ago and by about 4,000 years ago had reached its present level. With the establishment of true estuarine conditions, sedimentation in the Bay changed from alluvial sands and silts to dark-colored estuarine clays and silts, commonly called Bay Mud. Deposition of sandier sediment was confined to channels.

Since about 1850, human activities have made enormous modifications to the Bay, causing changes in the patterns of circulation and sedimentation. Between 1856 and about 1900, hydraulic mining in the Sierra foothills deposited several feet of sediment throughout the Bay. Starting in the 1800s, the construction of levees and dikes altered the patterns of drainage and annual flooding in the Sacramento River delta. Also, the placement of fill at numerous localities around the Bay margins has dramatically altered the shoreline profile during historic time.

4.4.2.4 Regional Seismic Setting

The San Francisco Bay region is located on the boundary between the North American and Pacific tectonic plates. The Pacific plate is moving northwest relative to North America across a plate boundary oriented in a north-northwest direction that is approximately 100 km wide. This zone encompasses all the major faults in Northern California (Figure 4-3). The relative motion across this plate boundary amounts to 35 to 38 millimeters per year, with the majority of this motion occurring during large earthquakes (Working Group on California Earthquake Probabilities 1999). Geologically, this region is one of the most active in the world, highlighted by the number of large, damaging earthquakes that have occurred during historical time. Major earthquakes have occurred along the margins of the Bay on the San Andreas and Hayward faults in 1836, 1838, 1868, and 1906 (Bakun 1999). Some slip also occurs as aseismic fault creep (i.e., fault movement that does not generate earthquakes) on the Hayward, Concord, and Calaveras faults (Galehouse 1992). The majority of contemporary seismicity in the Bay area is associated with the major faults, namely, the Hayward, Rodgers Creek, San Gregorio, Calaveras, and San Andreas faults, or related secondary structures located within about 5 km of the major faults (Zoback et al. 1999).

4.4.3 Project Setting

4.4.3.1 Site Topography

The proposed project site consists primarily of former mudflats and marshlands that have been isolated from tidal action by levees. These levees extend along the banks of the Napa River and surround the individual ponds formerly used in the production of salt. The Napa River levees are

owned and maintained by local public agencies and private property owners. The salt pond levees are currently owned by the State of California and are not maintained for flood protection purposes.

A combination of Light Detection and Ranging (LiDAR) remote sensing technology and land-based Real-Time Kinematic Global Positioning System (GPS) survey methods were used to collect topography data in the proposed project area. LiDAR data were collected on February 3 and 4, 2005. LiDAR data provided elevations for portions of the site not inundated by water (e.g., levees, uplands). Land-based topography data were collected in March and April 2005. The land-based survey provided topography data of portions of the site that were inundated during the LiDAR flight.

Geographic Information System (GIS) software (ArcGIS version 9.0) was used to combine the survey data sets and generate a topographic map of the site (Figure 2-5). Ground elevations at the site range from approximately -3.1 to 30.0 feet NAVD 88. The topographic high, Green Island, is located on the northern portion of the site.

4.4.3.2 Site Stratigraphy

The proposed project area is situated in a lowland area at the north margin of San Francisco Bay. Geologic units mapped at the site include artificial fill, Bay Mud, and the Huichica Formation (Bezore et al. 2002). These units are described in the following sections.

Artificial Fill

Artificial fill is found in the vicinity of Green Island vicinity, north of CBs 1 through 4, and forms the embankment for the Northwest Pacific Railroad line that crosses the northeast portion of the proposed project site. Artificial fill also exists along the Napa River shoreline. This fill consists of angular cobbles and small boulders (riprap), concrete, and reinforced steel bar (rebar).

The areas adjacent to Green Island are used for salt harvesting, processing and shipping facilities, office buildings, and site access. The depth of artificial fill likely varies from a few feet up to approximately 10 feet. While information is limited on the artificial fill's characteristics, it is reasonable to assume that it is composed of local material; likely a mixture including sand, silt, and clay originating from adjacent nearby surficial deposits or hydraulic dredging of the Napa River. Testing would be required to determine potential corrosivity of the fill material.

Levees in the proposed project area were constructed from native Bay Mud of varying degrees of compaction, and were repaired using similar material (CSCC and CDFG 2004).

Bay Mud

The majority of the site is underlain by Bay Mud of varying thickness. Bay Mud is typically a soft, compressible, organic-rich marine deposit of silt and clay with peat and local thin sand and gravel lenses.

Huichica Formation

Green Island and the higher portions of the hills immediately east of the site are of the Pliocene-age Huichica Formation (Th). The Huichica Formation is composed of fluvial gravel, sand, silt and clay derived mostly from the Sonoma Volcanics.

4.4.4 Geologic and Seismic Hazards

4.4.4.1 Surface Fault Rupture

Surface fault rupture has occurred on a number of faults within the study region during the last 10,000 years (Table 4.4-1). The San Andreas, Hayward, Calaveras, and Greenville faults have all experienced surface rupture associated with large, damaging earthquakes during historic time (Table 4.4-1, Figure 4-3).

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy in California (California Division of Mines and Geology 2000). Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet).

No active faults have been mapped in the site and none of the former salt ponds are in an earthquake fault zone designated by the state under the Alquist-Priolo Act. Surface rupture is, therefore, not considered to pose a potential impact to the site.

Table 4.4–1
Major Active Faults in the San Francisco Bay Area

Fault Name	Maximum Length (km)	Maximum Magnitude (M_w)*	Dip (°)	Approximate Age of Most Recent Rupture Event	Slip Rate (mm/yr)
San Gregorio	175	7.7	90	Holocene	7 ± 3
San Andreas	474	7.9	90	1989	24 ± 5
Rodgers Creek	63	7.1	90	Holocene	9 ± 2
Hayward	87	7.1	90	1868 (Currently creeping)	9 ± 2
Calaveras	123	7.5	90	Holocene (Part in 1851)	15 ± 3
Concord	20	6.6	90	Holocene (Currently creeping)	4 ± 2
Green Valley	36	7.0	90	Holocene (Currently creeping)	5 ± 3
Coast Range-Sierra Block	41	6.6	15 WSW	Holocene	1.5 ± 0.5

Table 4.4–1
Major Active Faults in the San Francisco Bay Area

Fault Name	Maximum Length (km)	Maximum Magnitude (M_w)*	Dip (°)	Approximate Age of Most Recent Rupture Event	Slip Rate (mm/yr)
Greenville	73	7.2	90	Holocene (Part in 1980)	2.0 ± 1.0
Ortigalita	92	7.2	90	Holocene	1.0 ± 0.5
West Napa	33	6.8	90	Holocene	1.0 ± 0.5
Mount Diablo	25	6.7		Holocene	3.0 ± 1.0

Source: Working Group on California Earthquake Probabilities (2003)

* Measurement of earthquake size based on the energy released. The amount of energy released during an earthquake is a function of the surface area of the fault that has slipped, the amount of slip, and the rigidity of the rock through which the fault passes.

4.4.4.2 Earthquake Ground Shaking

Ground shaking is the primary cause of earthquake damage to human-made structures, including levees. The amount of earthquake shaking at a particular site is a function of earthquake magnitude, the type of earthquake source (i.e., type of fault), distance between the site and the earthquake source, and the geology of the site in question. The larger the earthquake and the shorter the distance between the earthquake source and the site, then the greater the amount of shaking. Seismic energy decreases, or attenuates, with increasing distance from the earthquake source. However, areas with soft soils tend to amplify ground shaking; the influence of the underlying soil on the local amplification of earthquake shaking is called the *site effect*.

The National Earthquake Hazards Reduction Program has defined five soil profile types (A–E) based on their engineering parameters including shear-wave velocity (Vs). Soil profiles with a low shear-wave velocity experience can amplify shaking, whereas soil profiles with a high shear-wave velocity tend to experience weaker shaking. The proposed project site is underlain by water-saturated mud and unconsolidated sediments, with Bay Mud artificial fill composing each of the surrounding levees. These conditions correspond to soil profile type E, which has the lowest shear-wave velocities (less than 200 meters per second) of the five soil profile types (CSCC and DFG 2004). This type of substrate has been shown to amplify and prolong ground shaking, particularly during large seismic events.

The site has the potential to experience ground shaking as a result of seismic activity on any of the Bay Area's principal active faults. Moreover, the site is located between the Rodgers Creek fault and the Concord–Green Valley fault and just north of the northern end of the Hayward fault. The closest fault is the northwest-trending Rodgers Creek fault. The southern tip of this fault lies approximately 2 miles west of the proposed project site. The Concord–Green Valley fault is approximately 15 miles to the east. The northern section of the Hayward fault, about 3 miles south of the proposed project site, has a 32 percent probability of one or more magnitude 6.7 earthquakes over the next 30 years (USGS 1999).

USGS (1999) estimates the rates of occurrence of earthquakes and 30-year earthquake probabilities. The USGS study considers a range of magnitudes for earthquakes on the major

faults in the region. The California Division of Mines and Geology also has an estimate of the range of peak ground accelerations (g) (a measure of the intensity of ground shaking during an earthquake) expected in the proposed project vicinity. This range may exceed 0.70 g during a major earthquake (California Division of Mines and Geology 1996).

Depending on the direction of wave propagation of the ground motion and the underlying geologic conditions, localized ground amplification effects may cause an increase in peak ground acceleration. This amplification effect was observed during the 1989 Loma Prieta earthquake, where sections of the I-880 Cypress Freeway structure located in Oakland (62 miles from the earthquake's epicenter on the San Andreas fault, and more than 10 miles from the proposed project site) and founded on soft soils collapsed, while other sections founded on dense/stiff soils did not collapse.

Site-specific earthquake ground motions were not calculated as part of this report. However, given the soil types and the proximity of the proposed project site to faults capable of producing high ground acceleration, it would likely experience strong ground shaking during a large earthquake.

4.4.4.3 Liquefaction

Liquefaction is the transformation of a granular material from a solid state into a liquefied state as a consequence of increased pore pressure and decreased effective stress (Youd 1973). Observed types of ground failure resulting from liquefaction can include sand boils, lateral spreads, ground settlement, ground cracking, and ground warping (Youd and House 1978). Liquefaction occurs in saturated soils.

When liquefaction occurs, the strength of the soil decreases, and the ability of a soil deposit to support foundations for buildings or other structures is reduced. Liquefied soil also exerts higher pressures on retaining walls, which can cause the walls to tilt or slide. This movement can cause settlement of the retained soil and destruction of structures on the ground surface.

The loose, poorly consolidated, saturated deposits that underlie the site have a high potential for liquefaction. Based on review of the Association of Bay Area Governments' Regional Liquefaction Map and other supporting documents, the entire proposed project site is susceptible to liquefaction triggered by strong shaking from an earthquake on one of the Bay area's active faults (California Division of Mines and Geology 1980, 1982).

Lateral spread is the lateral displacement of surficial blocks of sediment as the result of liquefaction in the subsurface. It occurs in loose, unconfined sedimentary and fill deposits, but can also occur in consolidated fills over loose sand or soft mud deposits. Once liquefaction transforms the subsurface layer into a fluidized mass, gravity may cause the mass to move down slope towards a cut slope or free face (such as a river channel or a canal). Lateral spreads most commonly occur on gentle slopes that range between 0.3° and 3°. Some potential exists for lateral spreading to occur along pond levees and areas adjacent to the riverbank.

4.4.4.4 Ground Lurching

Ground lurching is the horizontal movement of ground located adjacent to slope faces during strong, earthquake-induced ground motion. The results of ground lurching include longitudinal cracking parallel to the slope face at some distance setback from the top of the slope. Areas in

the site susceptible to ground lurching as a result of fill placement over soft Bay Mud and slope exposures include the Green Island vicinity north of CBs 1 and 2. Other fill embankments located within the site may be susceptible to ground lurching (CSCC and CDFG 2004).

4.4.4.5 Subsidence

Land surface subsidence can result from both natural and human-made phenomena. Natural phenomena include subsidence resulting from tectonic deformations and seismically induced settlements (see liquefaction), soil subsidence due to consolidation, subsidence due to oxidation or dewatering of organic-rich soils, and subsidence related to subsurface cavities. Subsidence or settlement related to human activities includes subsidence caused by decreased pore pressure due to the withdrawal of subsurface fluids, including water and hydrocarbons.

The northern shoreline of San Pablo Bay is experiencing contemporary subsidence, probably as a result of a combination of compaction of sediments with a high organic content and ongoing tectonic subsidence (Ogden Beeman and Associates 1992).

4.4.4.6 Expansive Soils

Expansive soils contain mixed-layer clay minerals that increase and decrease in volume upon wetting and drying, respectively. Expansive soils are common throughout California and can cause damage to foundations and slabs unless properly treated during construction. Most fine-grained deposits along the margins of San Francisco Bay contain mixed layer clays and exhibit expansive or potentially expansive behavior. Soils present at the proposed project site include expansive soils (Reyes clay, Reyes silty clay, and Bay Mud). These soils exhibit shrink-swell behavior (Soil Conservation Service 1972, 1985).

4.4.4.7 Mass Wasting

Mass wasting is downward movement of soils and rock under gravity, including landslides, rock falls, and debris flows. Mass wasting requires source materials, a slope, and a triggering mechanism. Source materials include fractured and weathered bedrock and loose soils. Triggering mechanisms include earthquake shaking, heavy rainfall, and erosion.

Existing landslide hazards are minimal or nonexistent at the site because surface gradients are gentle to moderate. A review of slides and earth flows for Napa County revealed that the proposed project site is in an area of gentle to moderate slopes at low elevation that has little or no potential for the formation of slumps, translational slides, or earth flows except along stream banks and terrace margins (Wentworth et al. 1997). Therefore, landslides pose little threat in the proposed project area.

4.4.4.8 Tsunami and Seiche

A “tsunami” (Japanese word meaning “harbor wave”) is a water wave or a series of waves generated by an impulsive displacement of the surface of the ocean or other body of water. Tsunamis can travel across oceanic basins and cause damage several thousand miles from their sources. Most tsunamis are caused by a rapid vertical movement along a break in the earth’s

crust, i.e., a tectonic fault rupture on the bottom of the ocean resulting in displacement of the column of water directly above it.

A seiche is a periodic oscillation or "sloshing" of water in an enclosed basin such as San Francisco Bay. The period of oscillation can range from minutes to hours. The 1898 "Mare Island" earthquake is reported to have caused a seiche in the northern part of the Bay (Toppozada et al. 1992). No reports of damage are associated with this event.

Ritter and Dupre (1972) show that for a tsunami originating outside San Francisco Bay, the amount of inundation based on tsunami run-up decreases to 50 percent of its maximum at the Golden Gate by the time it passes the Bay Bridge to the south and the Richmond-San Rafael Bridge to the north. By the time the tsunami reaches Carquinez Strait, the run-up would only be approximately 10 percent of its maximum at the Golden Gate. Tsunami run-up results in inundation and flooding of low-lying areas, and where the waves have sufficient energy causes significant erosion.

A review of existing data on regional tsunami potential and magnitude, and predictions of rates of sea-level rises indicates that inundation hazards to the site from tsunamis, wave run-up, or sea-level rise are minimal because the proposed project area is located in existing marshland and much of the potential wave energy would be attenuated before reaching the proposed project area.

4.4.4.9 Settlement

Experience with similar sites indicates that loads placed on unconsolidated sediments, such as Bay Mud, may result in settlement in excess of 12 inches.

4.4.4.10 Erosion

The levees were constructed with native Bay Mud and are, therefore, subject to erosion from wind/wave action and tidal inundation. The river front levee is armored with riprap.

4.4.4.11 Shallow Groundwater

Groundwater beneath the site is considered shallow, less than 10 to 15 feet below the ground surface. Geotechnical consequences of shallow groundwater conditions include, but are not limited to, special dewatering requirements during excavation/construction, ground-instability-affecting earthwork activities, and excessive water pressure and infiltration acting upon below-grade facilities and structures.

4.4.5 Impacts and Mitigation Measures

4.4.5.1 Methodology

This assessment focused on the potential for major failures of the levees and other structures built for the proposed project because of geologic hazards. The analysis estimated the probability and magnitude of seismic events in the proposed project vicinity based on current seismic information collected by the National Earthquake Hazards Reduction Program. These estimates, coupled with known geotechnical data on the soils that would be used for the construction of the

proposed project, were used to assess the potential for damage caused by geologic hazards. This evaluation also took into account the ability of state-of-the-practice engineering design criteria to prevent or minimize damage to human-made structures from the kinds of geologic hazards present at the proposed project site.

4.4.5.2 Significance Criteria

Impacts on geology and soils were analyzed qualitatively based on a review of soils and existing geologic data of the proposed project site. Criteria based on the CEQA Guidelines were used to determine the significance of geology, soils, and seismicity-related impacts. The proposed project would have a significant impact on geology, soils, and seismicity if it could expose people or structures to potentially substantial adverse effects, including the risk of facility damage, loss, injury, or death involving:

- Surface rupture of a known earthquake fault
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Tsunamis and/or seiches
- Substantial soil erosion or loss of topsoil
- Construction of structures on a geologic unit or soil that is unstable or that would become unstable as a result of the proposed project and potentially result in an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse
- Expansive soils and/or differential settlement, or
- Shallow groundwater.

The proposed project was also assumed to result in a significant geologic impact if it could preclude access to rare or unique mineral resources, damage unique geologic or geomorphic features, or destroy scientifically valuable fossils.

4.4.5.3 Impacts and Mitigation Measures

The potential geological impacts associated with the proposed project are similar for all the alternatives. The impacts are generally associated with (1) seismic activity (strong ground shaking can cause unintended failure of existing levees), (2) construction involving raising the existing levees (potential subsidence and/or significant differential settlement), (3) intentionally breaching existing levees (potential soil erosion), and (4) construction of recreational facilities (structures built on expansive soil, unstable or saturated soil, and/or shallow groundwater).

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

GEO-1: Seismic surface rupture	Surface rupture of a known earthquake fault may cause levee failure or structural damage.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: The potential for ground rupture during an earthquake is limited to areas within 250 feet of a fault. According to USGS and special studies maps, the nearest known and mapped fault is the Rodgers Creek fault, which lies approximately 2 miles west of the proposed project site. Because of the distance to this fault, surface fault rupture is unlikely to pose a substantial risk of personal injury, loss of life, or damage to property in the proposed project site.

GEO-2: Seismic ground shaking	Existing levees are at risk from strong ground shaking from a major earthquake in the Bay Area (USGS 1999).
Significance:	Less than significant
Mitigation:	No feasible mitigation

Impact Analysis Discussion: The proposed project will not change the perimeter levee's ability to withstand the effects of a major earthquake in the Bay Area. Measures proposed as part of the project to reduce the risk of eastern levee failure include conducting a geotechnical field investigation and engineering analyses of the existing levees. Properly designed engineering measures for the eastern levee would be implemented to allow it to withstand seismic events to the extent practicable. However, the site is on unconsolidated sediments, which are known to amplify and prolong seismic ground shaking, potentially resulting in liquefaction and lateral spreading. Levees would receive regular maintenance; however, levee failure could result in inundation of adjacent property and potential flooding of existing structures and residences.

GEO-3: Construction on unstable substrate	Raising the existing eastern perimeter levees and the perimeter levee surrounding the managed pond unit may impose excess loads on the unstable substrate, potentially leading to subsidence and/or significant differential settlement.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Localized loading (e.g., as a result of levee construction) would likely increase substrate shear stresses and has the potential to result in levee failure if design or construction is inadequate or inappropriate. In addition, the gated culverts, proposed to be installed at the northern end of CB 2 and near the southwest corner of CB 1 for the managed pond unit, would be subject to differential settlement. However, DFG has proposed as part of the

project to conduct a geotechnical field investigation and engineering analyses to assess the condition and stability of the existing levees. The means of raising the levees will be evaluated and engineering measures for safely raising the levees will be properly designed and implemented. In the event that unstable geologic units or soils are encountered during construction of the gated culverts, the contractor will remove such materials and will backfill with engineered fill meeting the required specifications for compaction and shear strength. The proper operation of the gated culverts will be verified periodically, and the structures will be properly maintained and replaced as needed. Therefore, this impact would be less than significant.

GEO-4: Effects of expansive soils	Expansive soils in the upland area could exhibit shrink-swell behavior that could damage proposed structures.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Public access and recreational components include new structures such as restrooms and a future environmental interpretive center to be constructed on the property. Soils present at the project site include expansive soils (Reyes clay, Reyes silty clay, and Bay Mud). These soils exhibit shrink-swell behavior that could damage structures (Soil Conservation Service 1972, 1985). Structures will be designed and constructed in accordance with applicable engineering standards and building codes. Thus, shrink-swell behavior would not pose a risk of personal injury, loss of life, or significant damage to property. In the event that unstable geologic units or soils are encountered during construction, the contractor will remove such materials and will backfill with engineered fill meeting the required specifications for compaction and shear strength. Therefore, this impact would be less than significant.

GEO-5: Tsunami damage	Wave run-up from a tsunami may damage or overtop existing levees, resulting in levee erosion and/or failure and flooding of the neighboring properties.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Modeling performed for sites near the project site that are also connected to the Bay indicates that both the 100-year tsunami and the 500-year tsunami would have the potential to inundate the project site (Garcia and Houston 1975). Wave run-up in San Pablo Bay resulting from the 100-year tsunami would likely range from 3.3 feet along the shore of Tubbs Island (Sonoma Creek and south of State Route 37) to 4.1 feet in portions of Novato Creek. The 500-year tsunami may likely result in run-up ranging from 3.7 feet at Tubbs Island to 6.3 feet on Novato Creek. Wave run-up from a tsunami may damage or overtop existing levees, resulting in levee erosion and/or failure and flooding of the neighboring properties. As part of the proposed project, the eastern portion of the perimeter levee would be raised to the proposed flood protection elevation of 10.0 feet (NAVD 88). This change would provide flood protection for adjacent properties and would have sufficient freeboard to provide protection from the expected

level of water run-up due to tsunamis or seiches. In addition, recreational users and operations and maintenance staff will be protected from all but proximally generated events by NOAA's tsunami warning system. Therefore, this impact would be less than significant.

GEO-6: Soil erosion	Exposure of native and engineered soils during construction activities could make them prone to erosion due to periods of increased slope runoff during winter rainstorms (even on gentle and moderate slopes).
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: As part of the proposed project, areas of grading and other construction activity would be designed to minimize runoff. In addition, a Stormwater Pollution Prevention Plan (SWPPP) and a Stormwater Monitoring Program will be developed and implemented. The Clean Water Act, National Pollutant Elimination System (33 United States Code 1342) requires that construction projects disturbing more than 1 acre of land must develop and implement a SWPPP. Implementation of the Best Management Practices in the SWPPP will minimize post-construction erosion. Therefore, soil erosion impacts would be less than significant by implementing the SWPPP. (Erosion and/or scour in the Napa River is discussed in WR/HYD-1.)

GEO-7: Shallow groundwater	The presence of shallow groundwater could adversely affect excavation/construction activities.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Earthwork activities could be affected by ground instability caused by shallow groundwater and saturated soils, and excessive water pressure and infiltration could act adversely upon below-grade structures and facilities. The impact of shallow groundwater has more significance to the added cost of construction or damage to property in the project site, and is unlikely to pose a substantial risk of personal injury or loss of life. As part of the proposed project, special dewatering measures would be designed and implemented to allow excavation in areas where shallow groundwater is present. In areas where unstable ground and/or saturated soils are encountered during earthwork activities, the contractor would take measures such as temporarily placing a bridging layer of granular fill or geotextile to facilitate planned activities. Below-grade structures and facilities, in particular, the proposed large-diameter culverts with slide gates for the managed pond unit, would be designed to withstand excessive water pressure and infiltration. Therefore, this impact would be less than significant.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Geology-related impacts for Alternative 1 are essentially equivalent to the proposed project. No mitigation is required.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Geology-related impacts for Alternative 2 are essentially equivalent to the proposed project. No mitigation is required.

ALTERNATIVE 3 – NO PROJECT

Geology-related impacts for the No Project Alternative are similar to the proposed project. Impacts associated with seismic ground shaking (GEO-2) considered "significant and unavoidable" are also similar to the proposed project. This is because levee failure resulting from excessive ground shaking could result in an unexpected release of highly saline water to the river. Levee failure and associated soil loss could cause plugging of sloughs with sediment and thus impede drainage. Differences with the proposed project are that there would be no construction related impacts and minimal opportunity for scour or erosion of the inboard levee. However, continued erosion, caused by wind/wave action within the ponds or by scour along the outside of the ponds, could result in further deterioration of the existing levees in the project area and increase the likelihood of levee failure due to erosion.

4.5 HAZARDS AND HAZARDOUS MATERIALS

4.5.1 Sources of Information

Significant portions of this section were developed from the following resources:

- *American Canyon Pond Site Hazardous and Toxic Waste Screening Characterization* (EVS Consultants, Inc. 2001)
- *American Canyon Ecosystem Enhancement Project, Initial Study/Environmental Assessment* (City of American Canyon 2002b)
- *Site Investigation Report, Cargill Salt Napa Site and Baumberg Concentrator Ponds, Volume 1 – Report and Attachments A through C* (CH2M Hill 2003.)
- *Site Removal Report, 2983 Green Island Road, American Canyon, California* (Treadwell and Rollo 2003)

4.5.2 Regional Setting

4.5.2.1 Potential Sources of Contamination

Land uses surrounding the proposed project area may present potential sources of hazardous substances on the site. Pesticides from agricultural runoff and those associated with former mosquito abatement activities may affect the proposed project site. Cattle grazing, animal husbandry activities, and agricultural runoff may contribute coliform bacteria, ammonia, nitrate, and phosphorus. Miscellaneous industrial and airport activities on the surrounding lands likely involve the use of hazardous substances and have the potential for environmental contamination due to chemical spills, discharges, and/or leaking storage tanks. The former municipal landfill, public sanitation facilities, and automobile junk yards/self-dismantling facilities[1] are also potential sources of contamination.

4.5.2.2 Historical Investigations

A Hazardous and Toxic Waste screening characterization was conducted for the USACE at the American Canyon Pond site, which borders the proposed project site on the south. The purpose of the investigation was to evaluate soil, sediment, and surface water for the possible presence of contamination to see if excess material from the southern levee at the American Canyon Pond site would be suitable for use as cap material at the adjacent American Canyon Landfill site. Results showed that material from the levee and adjacent areas did not meet the criteria for disposal in the American Canyon Landfill. Furthermore, two soil samples exceeded the California Title 22 Total Threshold Limit Concentrations for copper and zinc, and six soil samples exceeded the Soluble Threshold Limit Concentrations for copper, lead, and zinc.

[1] Depending on the water line installation location, there is a potential to encounter contaminants during construction.

A Phase 1 Environmental Assessment was performed by ESA in 1999 for the marsh area immediately to the south of the proposed project site, known as the American Canyon Ecosystem Restoration Project site. The Phase 1 Environmental Assessment is discussed in the *American Canyon Ecosystem Enhancement Project Initial Study/Environmental Assessment* (City of American Canyon 2002b). No observed signs of underground storage tanks, aboveground storage tanks, hazardous materials use, disposal, or contamination were noted at the subject site during the field visits. A regulatory agency database search was performed for records of known storage tank sites and known sites of hazardous materials generation, storage, or contamination within 1 mile of the American Canyon Ecosystem Restoration Project site. Based on the database search, only one site was identified: American Canyon Sanitary Landfill.

American Canyon Sanitary Landfill operated from 1942 to 1995, when the landfill stopped accepting waste on a regular basis. As part of the landfill closure process, leachate sumps, groundwater monitoring wells, gas wells, gas pipelines, and surface monitoring locations to evaluate and monitor leachate were installed. In an effort to prevent lateral migration of leachate through permeable soils located adjacent to the landfill, a subsurface cutoff trench of a minimum width of 3 feet was excavated around the landfill perimeter and backfilled with Bay Mud.

A Phase 1 Environmental Site Assessment of the proposed wastewater treatment plant site, located to the southeast of the proposed project site, was performed in September 1997. The site assessment is discussed in the *Wastewater Treatment and Reclamation Project Draft Environmental Impact Report* (Dames and Moore 1998). No direct evidence of contamination by hazardous substances, hazardous waste, or storage tanks at the subject property was identified. According to the Napa County Sheriff's Department, until approximately 6 years ago, methamphetamine labs operated on the proposed wastewater treatment plant site. Operations of these types of labs typically produce hazardous wastes, including phosphine gas, solvent, benzene, chloroform, and thionyl chloride, which may have impacted the land adjacent to the proposed project site.

4.5.3 Project Setting

4.5.3.1 Potential Sources of Contamination

The 46-acre upland portion of the proposed project site is the most developed, with a number of structures, including a maintenance shop, locomotive barn, steam-cleaning wash area, former oil shed (now empty), former sand-blasting/painting area, and former paint shed area. Three railroad yard storage sheds (one existing and two former), railroad tie storage and dump areas, a rail storage area, and railroad tracks are also located in the northern upland portion of the site. A debris burial area that was reportedly excavated by Cargill extends approximately 150 feet from north to south and approximately 40 feet from east to west on the east side of the upland portion of the site. One residence is located in the upland portion of the site. Barge channel dredge spoil stockpiles are located north of the barge channel, in the upland portion of the site. Dredged material composition varies considerably depending on the source material. Analytical results from the barge channel dredged material samples are discussed in Section 4.7.3.3, Upland Areas.

Salt ponds, including crystallizer beds, wash ponds, and pickle ponds occupy the majority of the project site. Bittern is stored in tanks on the project site. Continuing deterioration of the levees as a result of wind and wave erosion and scouring could result in a levee breach in the future,

leading to an uncontrolled release of highly saline water. During the summer months, high evaporation rates lead to a reduction in the volume of water in the ponds. As a result, salts precipitate in the higher salinity ponds. The precipitated salts tend to form a hard crust, reducing the potential for the wind to blow dust and salt from the ponds. Excess salinity and bittern can have lethal effects on fish, although the potential for toxicity due to bittern release is low because it is stored in tanks at the project site. In addition to the ponds, the southern levees are a potential contamination source, based on areas of small debris and broken pieces of glass that are visible on the surface of the levees.

4.5.3.2 Historical Investigations

Cargill routinely measures salinity in the concentrator ponds as part of the salt-making process. Historically, the salinity of the water in the concentrator ponds has varied through an annual cycle, reaching a high in the late summer and a low in the late winter. The salinity measurements recorded since March 2003 suggest a pattern of generally decreasing salinity in the pickle ponds, as discussed in Section 4.7, Water and Sediment Quality.

Phase 1 Environmental Site Assessment work was conducted at the proposed project site in 2000 and 2002 to investigate past existing conditions at the site and determine if any known or observable condition would indicate that an environmental condition might exist at the site.

A Phase 2 site investigation was performed in Fall 2002 to characterize both the upland areas of the site and the salt ponds (CH2M Hill 2003). Shallow soil samples in the ponds were collected from seven crystallizer beds, three wash ponds, and three pickle ponds. Upland soil samples were collected from the barge channel dredge spoils stockpiles, the southern levee, the residential area, and the maintenance areas. Sampling locations were selected to represent overall site conditions or targeted locations with evidence of possible contamination, such as soil staining or low points in the surface topography. The locations of the sampling points are shown on Figure 4-4. Samples were analyzed for some or all of the following constituents: TPH as gasoline, as diesel, and as motor oil (TPH-g; TPH-d, TPH-mo, respectively), VOCs, SVOCs including PAHs, PCBs, and metals.

Most of the contamination detected during the Phase 2 site investigation was in the upland areas of the site. In the salt pond soil samples, metals concentrations appeared to be representative of background levels, and two SVOCs were detected at concentrations significantly lower than the Industrial Preliminary Remediation Goals (PRGs). The following areas of contamination were identified in the upland portions of the NPSR proposed project during the Fall 2002 investigation:

- TPH was detected in numerous shallow soil samples, most notably around the exterior of the locomotive barn and maintenance shop, and adjacent to and in the sump of the concrete pad used for steam cleaning. Maximum reported concentrations of TPH-g, TPH-d, and TPH-mo in shallow soil in these areas were 2.1 milligrams per kilogram (mg/kg), 1,100 mg/kg, and 5,800 mg/kg, respectively, based on wet weight. These maximum values of TPH-d and TPH-mo exceeded the San Francisco Bay Regional Water Quality Control Board (RWQCB) Risk-Based Screening Levels (RBSLs) for residential land use (500 mg/kg for TPH-d and 500 mg/kg for TPH-mo) and commercial/industrial land use (500 mg/kg for TPH-d and 1,000 mg/kg for TPH-mo). The reported TPH-d concentrations exceeded 500 mg/kg (based on dry weight) in only two shallow soil samples collected at each end of the locomotive barn and

one sample located in the steam-cleaning wash area. Concentrations of TPH-mo exceeded 1,000 mg/kg (based on dry weight) in 9 of the 13 shallow soil samples collected on the exterior of the structures. Analytical results indicated that the detected petroleum hydrocarbons may be a lubricating oil or another relatively heavy petroleum fraction. The concentrations were found to decrease significantly with depth.

- A single PCB was detected in shallow soil samples adjacent to the steam-cleaning wash area and the maintenance shop. Three of the reported concentrations southeast of the steam-cleaning wash area concrete pad exceeded the RBSLs for residential and commercial/industrial land use (0.22 mg/kg and 1 mg/kg, respectively, based on dry weight). The maximum reported concentration was 3.7 mg/kg (based on wet weight) directly adjacent to the concrete pad. The concentrations were lower, but still greater than the RBSLs, approximately 10 feet from the edge of the concrete pad.
- Lead concentrations exceeded the RBSL for residential land use (200 mg/kg) in six of the nine shallow soil samples collected directly adjacent to the residences. Lead concentrations in the nine samples ranged from 34.5 mg/kg to 1,680 mg/kg, based on dry weight. Flakes of paint were observed on the residences and on the ground.
- An area of perched groundwater at approximately 5 feet below ground surface (bgs) was identified within the debris removal area that reportedly had been excavated by Cargill. A shallow aquifer was also identified at approximately 45 feet bgs. Somewhat elevated levels of petroleum hydrocarbons were reported in a sample from the perched aquifer. Laboratory results suggested that the TPH contamination is limited to the perched groundwater and does not extend beyond the dimensions of the excavation or to the water table. Low levels of acetone and other VOCs were also detected in many of the samples collected in this area.
- Seven samples were collected from four borings in the southern levees. Somewhat elevated concentrations of metals, TPH, and PAHs were detected in a single sample collected at 8 feet bgs in the southern levee. In this sample, cadmium was detected at 9.4 mg/kg (dry weight basis), lead was detected at 2,420 mg/kg (dry weight basis), TPH-d was detected at 170 mg/kg (wet weight basis), TPH-mo was detected at 1,800 mg/kg (wet weight basis), and PAH concentrations ranged from 0.8 mg/kg to 4.2 mg/kg (wet weight basis). The concentrations of lead and cadmium exceeded the residential and commercial/industrial RBSLs (200 mg/kg and 750 mg/kg, respectively for lead; 1.7 mg/kg and 12 mg/kg, respectively for cadmium). The concentration of benzo(a)pyrene (1.2 mg/kg based on wet weight) detected in the same sample exceeded the residential and commercial/industrial RBSLs. The contaminants detected in the sample appeared to be isolated in extent and directly related to the ash, metal debris, and battery part that were observed in the sample interval. The sampling results suggested that the material in the levees is heterogeneous and that some levee sections may contain anthropogenic materials.

The Phase 2 investigation recommended soil removal in two limited upland areas of the site and did not recommend any remedial work for the ponds. Based on the results of the Fall 2002 investigation, soil removal was performed during May and June 2003 in the residential area where lead concentrations exceeded the removal criteria of 150 mg/kg and in the maintenance area where concentrations of TPH-d and TPH-mo exceeded the criteria of 100 and 500 mg/kg, respectively (Treadwell and Rollo 2003). In the residential area, soil was excavated around both residences and a garage. In the maintenance area, asphalt was removed and soil excavated

between the locomotive barn and maintenance shop and around the wash pad and adjacent shed. Verification sampling performed after excavation confirmed that all soil identified in the Fall 2002 investigation that exceeded the agreed-on criteria was excavated and removed from the property.

4.5.4 Impacts and Mitigation Measures

4.5.4.1 Significance Criteria

The following standards of significance are based on CEQA Guidelines, Appendix G. For the purposes of this EIR, an impact is considered significant if the implementation of the proposed project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (specifically, exposure of construction workers, the public, or the environment to hazardous materials such as fuel, oil, or other contaminants during construction)
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

The proposed project site is not within ¼ mile of an existing or proposed school and the proposed project would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. In addition, the proposed project is not located on a site that is included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5. Therefore, these criteria are not used in this analysis.

4.5.4.2 Project Impacts and Mitigation Measures

The proposed project site is not within ¼ mile of an existing or proposed school and the proposed project would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, these issues are not discussed further in this section.

PROJECT – TIDAL RESTORATION AND MANAGED POND

HAZ-1:Transportation of hazardous materials	The proposed project would result in the transport of hazardous materials to and from the proposed project site during construction activities that would not pose a significant hazard to the public.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Construction activities would include transporting and using hazardous materials such as fuels to the proposed project site. Hazardous materials transport is

regulated by numerous federal, state, and local laws and regulations that stipulate minimum standards for transportation requirements, spill prevention procedures, emergency response and contingency plans, risk management, and employee training procedures. In the event that a fuel or oil spill were to occur during the transport of this material to the proposed project site during the two-season construction period, these materials would not pose a significant hazard to the public.

HAZ-2: Exposure or release of hazardous materials	Construction activities for the proposed project could result in potential exposure to and/or release of hazardous materials/waste.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: As stated in Section 4.5.3.2, a Phase 2 environmental site investigation was performed in Fall 2002 to characterize both the upland areas of the site and the salt ponds (CH2M Hill 2003). Most of the contamination detected during the Phase 2 site investigation was in the upland areas of the site. The potential for the proposed project to result in exposure to and/or release of hazardous materials/waste related to the salt ponds is discussed in Section 4.7 of this EIR.

TPH, PCBs, elevated lead concentrations, and elevated concentrations of other metals were discovered at a few locations in the upland area and in the southern levee. The Phase 2 investigation recommended soil removal in two limited upland areas. Soil removal was accomplished during May and June 2003. During the Phase 2 investigation, only one sample collected in the southern levee contained elevated contaminant concentrations, which seemed to be isolated in extent and directly related to the ash, metal debris, and battery part that were observed in the sample. Since contaminated soil was removed from the upland area and elevated contaminants in the southern levee seemed to be isolated, it is unlikely that construction activities in the upland area or in the southern levee would result in potential exposure to and/or release of hazardous materials/waste.

Construction activities would include using fuels and oils associated with heavy machinery. Operation of this machinery could result in an accidental release of this material into the environment. Improper handing, use, or disposal of hazardous materials and waste could result in unacceptable exposures of construction workers. All contractors would be required to comply with applicable laws and regulations pertaining to worker safety and health. In addition, as part of the proposed project construction contractors working on the proposed project will be required to provide their employees with enhanced spill prevention and response training, and will be required to have spill response equipment available at the job site, as directed by the sponsors of the proposed project. Contractors will provide double containment for any hazardous materials or wastes at the job site. Contractors will be prepared to respond to any spill immediately and to fully contain spills in the proposed project area, including any open-water areas. Therefore, this impact would be less than significant.

HAZ-3: Excavation of contaminated soils	Excavation of soils for construction of the new water pipeline and tidal channels could cause health hazards to construction workers and the public should contamination be encountered.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Construction near sites that are potentially contaminated increases the risk that workers and the public may be exposed to hazardous materials during excavation and soil handling activities associated with the proposed project.

Soil contamination may be encountered during trench excavation for the proposed water pipeline along Green Island Road. Off-site migration of contamination, unauthorized dumping, or historic, unreported hazardous materials spills may adversely impact the soil in industrial and commercial land use areas. The water pipeline trench will be approximately two to three feet deep, approximately 4 feet wide, and groundwater is not expected to be encountered during excavation of this trench. In areas where the water table is below the planned excavation depth, contaminated groundwater is not expected to impact construction.

Subsurface migration of mobile contaminants within groundwater may provide a conduit to other project excavation areas. It is possible that shallow groundwater may be encountered during proposed intertidal channel excavation. This channel will be approximately 100 feet wide and two to three feet deep and will be dewatered as necessary during excavation. Due to the shallow depth and large width of the channel and the likely dewatering, workers would not likely be exposed to groundwater contaminants in the channel.

Implementation of investigation/remediation of any contamination discovered would result in long-term benefit to the community. Any remediation that would result due to proposed project implementation would reduce public health risks associated with contamination present at a site, and would reduce the potential for workers and the public from encountering such materials in the event of future excavation. Removal of toxic materials would also reduce the potential local source for groundwater contamination, which would also be beneficial in the long term.

As part of the proposed project, during the excavation activities associated with the new water supply pipeline, the contractor will inspect the exposed soil for visual evidence of contamination. The pipeline alignment would be sited to avoid potentially contaminated areas, e.g. it would be located on the south side of Green Island Road to avoid areas adjacent to the auto dismantling facilities. If visual contamination indicators are observed during excavation or grading activities, all work will stop and an investigation will be designed and performed to verify the presence and extent of contamination at the site. Results will be reviewed and approved by Napa County's Environmental Health Division or DTSC prior to continuing construction. The investigation will include collecting samples for laboratory analysis and quantification of contaminant levels within the proposed excavation and surface disturbance areas. Subsurface investigation will determine appropriate worker protection and hazardous material handling and disposal procedures appropriate for the subject site. Areas with contaminated soil and groundwater determined to be hazardous waste will be removed by personnel who have been trained through the OSHA-recommended 40-hour safety program (29 CFR 1910.120) with an approved plan for groundwater extractions, soil excavation, control of contaminant releases to the air, and off-site transport or on-site treatment. A health and safety plan, prepared by a qualified and approved

industrial hygienist, will be used to protect the general public and all workers in the construction area. Therefore, this impact would be less than significant.

HAZ-4: Release of irritant dust during construction	Construction activities could result in the release of irritant dust.
Significance:	Potentially significant
Mitigation HAZ-4:	The contractor will achieve compliance with the nuisance dust standard by implementing Mitigation Measure AQ-1. As described in Section 4.1, Air Quality, the contractor will be required to comply with most of BAAQMD's BMPs for dust control.
Residual Significance:	Less than significant

Impact Analysis Discussion: At ponds with existing salt crusts, construction activities may result in some of the salt crusts being pulverized by construction equipment. As a result, on-site construction workers could be exposed to high levels of irritant dust. This impact is considered potentially significant. As part of the proposed project, the proposed project sponsors will ensure that a site-specific health and safety plan is developed and implemented by the contractor as part of contract specifications. At a minimum, the contractor's health and safety plan must show how the contractor will comply with the nuisance dust standard set by Cal/OSHA in the immediate work area and at the perimeter of the work area. Implementation of Mitigation Measures AQ-1 would reduce this impact to a less-than-significant level.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Hazardous materials impacts and mitigation for Alternative 1 are equivalent to the proposed project.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Hazardous materials impacts and mitigation for Alternative 2 are equivalent to the proposed project.

ALTERNATIVE 3 – NO PROJECT

Under the No Project Alternative none of the hazardous materials/waste impacts associated with the proposed project would occur. These impacts are related to construction activities and no construction activities would occur under the No Project Alternative. Potential impacts associated with release of hazardous materials/waste related to the salt ponds are discussed in Section 4.7 of this document.

4.6 WATER RESOURCES / HYDROLOGY

4.6.1 Sources of Information

Sources of information in this section include:

- *Proposed SFO Runway Reconfiguration Project. Final Technical Report. Predicted Changes in Hydrodynamics, Sediment Transport, Water Quality, and Biotic Communities* (URS 2003)
- *Napa River Salt Marsh Restoration Project Final Environmental Impact Report.* (CSCC and CDFG 2004)
- Historical stream flow data at USGS Station 11458000 (http://waterdata.usgs.gov/ca/nwis/sw)
- *The Napa River Flood Protection Project, Progress and Plan Summary* (Napa County Flood Control and Water Conservation District 2004)
- *Upland Airport Alternatives for SFO Runway Reconfiguration* (URS 2001)
- *State of the Estuary 1992-1997* (SFEP 1997)
- Personal communications with Cargill staff (Barbara Ransom and Butch Paredes, 2005)

4.6.2 Regional Setting

4.6.2.1 Climate and Precipitation

See Section 4.2.1.2, Air Quality - Regional Setting for a description of the meteorology of the proposed project area.

4.6.2.2 San Francisco Bay-Delta Estuary

Overview

San Francisco Bay is a geographically and tidally complex system characterized by broad shoals and narrow channels. It can be considered as consisting of two systems, the North Bay and the South Bay. The North Bay system extends from the Golden Gate through the Central Bay, San Pablo Bay, Carquinez Strait, and Suisun Bay ending at the Delta. The South Bay extends from the Central Bay (starting about at the Bay Bridge) south to Guadalupe River and Coyote Creek near San Jose.

Many factors affect flows in the Bay, but water depth is the most important factor controlling the spatial variability of both magnitude and direction of currents (Cheng et al. 1993). The Central Bay has a highly complex bathymetry. Near the Golden Gate the depth is around 300 feet, while extensive intertidal mudflats are present at the eastern edge of the Central Bay. In addition, several islands are located within the Central Bay. San Pablo Bay, located north of the Central Bay, is characterized by a deep channel surrounded by broad shoals. San Pablo Bay is connected to Suisun Bay by the narrow Carquinez Strait. Suisun Bay is a shallow basin consisting of braided channels and shallow shoals.

The northern reach of San Francisco Bay is defined as the area north of the Richmond Bridge and includes San Pablo Bay, Carquinez Strait, and Suisun Bay. The bathymetric characteristics of Northern San Francisco Bay are presented in Table 4.6-1.

Table 4.6-1
Bathymetric Characteristics of North San Francisco Bay

	Total Area (mi^2)	Average Depth (feet, MLLW)
San Pablo Bay	105	9
Carquinez Strait	12	30
Suisun Bay	36	14.1
North San Francisco Bay	153	11.8

Ninety percent of the freshwater inflow to the Bay comes from the Delta (Cheng et al. 1993) and flows through the northern portion of the Bay resulting in a well mixed to partially mixed estuary (Walters et al. 1985; Uncles and Peterson 1995). Net Delta outflows vary from a low of about 1,760 to 5,300 cubic feet per second (cfs) in summers to high values of 282,000 to 420,000 cfs in wet winters. The tidal prism for the North Bay is about 764,000 acre-feet. These data correspond to a ratio of freshwater flow to tidal prism of less than 1 percent in the summer (well mixed) to around 20 percent during a wet winter (partially mixed).

Tides

Ocean tides are caused by the gravitational pull of the moon and the sun and are of three types: diurnal (daily), semidiurnal (twice daily), and mixed. The diurnal tide is characterized by a single high and single low water each lunar day or 24 hours 50 minutes (24.8 hours). These tides are common in the Gulf of Mexico and along the coast of Southeast Asia. They are sometimes referred to as K_1 tides. The semidiurnal tide has two high and two low waters each lunar day, and the heights of successive high and low waters are approximately the same. Semidiurnal tides are common along the Atlantic Coast of the U.S. and have a tidal period of 12 hours 25 minutes. These tides are sometimes referred to as M_2 tides and mainly follow the phase of the moon. The mixed tide has characteristics of both diurnal and semidiurnal tides. It has two high and two low tides each day with successive high tides and low tides having significantly different elevations and has a tidal period of 12 hours 25 minutes. This tide is the most common throughout the world and is the type found along the Pacific Coast of the U.S. including San Francisco Bay (Thurman 1985).

Pacific Ocean tides enter the Bay through the narrow opening at the Golden Gate and propagate landward as shallow-water waves that affect the entire estuarine system. These tides are the primary drivers of circulation in the bay (Walters et.al. 1985). The amplitudes and the phases of these incident tidal waves are modified by basin bathymetry, reflections of the waves from shores, bottom friction, and rotational effects of the earth (Coriolis acceleration). Tides with the greatest range occur during the new and full moon and are called spring tides. This time corresponds to the time of greatest difference between successive daily highs or lows. Tides with the smallest range occur during the moon's quarters and are called neap tides; at this time, the difference between successive daily high or low tides is the lowest. Tides also vary on an annual

cycle, with extreme high and low tides occurring in May/June and November/December (SFEI 1992).

Spatial variations in mean tidal elevations and tidal range are strongly influenced by the complex geographic and bathymetric configuration of the Bay. As a result, different types of tidal waves occur in different Bay basins. As the tide progresses through the Central Bay and into San Pablo Bay along the main channel, the tide acts as a progressive wave (maximum current speed near high water). However, a reflection of the tidal wave at Carquinez Strait causes the wave to take on the characteristics of a standing wave (slack current at high water), and the tidal amplitude in San Pablo Bay increases due to the reflection from Carquinez Strait. Beyond Carquinez Strait the tide progresses until it is dissipated by dispersion and friction. During a flood tide, ocean water moves through the Golden Gate and into the estuary's southern and northern reaches, raising the water level at the end of the South Bay by more than 8 feet, and raising the height of the Sacramento River at the upstream edge of the estuary by about 3 feet. On average, it takes about 2 hours for tidal influence to reach the end of the South Bay and 8 hours to reach Sacramento (SFEI 1992). The time and range of tides also varies with upstream distance. Mean tidal level is highest in the North Bay, but tidal range is greater in the South Bay. In general, tidal range decreases inland in the North Bay because of losses due to bottom friction and increases in the South Bay. For example, at the Golden Gate the tidal range is 4.1 feet. The range decreases to 2.9 feet at Sacramento and to 2.4 feet at Mossdale Wye, between Tracy and Manteca (SFEI 1991), and increases to 6.58 feet at the southern end of the South Bay.

SFPORTS is a cooperative program run by NOAA to collect real-time data valuable for navigation in the Bay. SFPORTS reports real-time hourly tidal heights continuously at five tide stations within the Bay. Only one is located in the North Bay, at Port Chicago in Suisun Bay (Station #5144). In addition, tidal heights are predicted at approximately 53 stations in the Bay and the Delta. The predicted tides are obtained using a correction factor applied to a control station. The accuracy of predicted tides depends on the correlation period used to derive the correction factors. Of these stations only one station in the North Bay, located at Pittsburg (Station #5096), is included in this study.

Monthly and Annual Tide Variability

An annual variability in water levels occurs in the Bay as it goes through periods of draining and filling over the course of a year. This variability can have a significant impact on residence times in the Bay. During periods when the Bay is filling (typically in the early winter and late summer) residence times increase; during periods when the Bay is drawing (typically late summer, fall, and spring) residence times decrease. The elevations usually peak about twice a year, with the larger peak around the months of January, February, and March, and a smaller peak at around October. The water level tends to drop the lowest level in about April and May, immediately after the highest peak, with another smaller drop in November after the second peak.

Tidal Prism

The tidal prism is defined as the volume of water that is exchanged between the ocean and the Bay, or conversely, between the Bay and the ocean. According to Smith (1987, the average tidal prism of the Bay is approximately 1.25 million acre-feet or about one-fourth of the capacity of

the entire system. Slightly higher values were calculated by Cheng et al. (1993) who calculated a tidal prism for the Bay equal to about 30 percent of the Bay volume.

Circulation

Pacific Ocean tides interact with the complex bathymetry of the Bay and with the Delta outflow to produce a complex circulation pattern. In general, the circulation in the North Bay is strongly influenced by the interaction of the tides and Delta outflow. Besides tidal flows and flows due to Delta outflow, residual circulation is also a very important component of the circulation when analyzing the net movement of water. Residual circulation is the circulation that remains when the periodic motions of the tides are removed from the analysis. They are due to wind, density differences, and nonsymmetric modification to the tidal circulation due to the large variation in basin bathymetry. Even though they may be an order of magnitude smaller than some of the tidal flows, they can have an important impact on the transport of pollutants and sediments in the Bay.

Tidal Currents

The deep channels in the Bay are the main routes for movement of tides and tidal currents. In the channels, current velocities are high, in the range of 100 to 200 centimeters per second (cm/s) (Cheng et al. 1993). Maximum tidal currents in the Bay occur at the Golden Gate and are on the order of 150 cm/s during flood tide and over 200 cm/s at maximum ebb tide (NOAA/NOS 1973).

The majority of the energy and momentum induced by tides is constrained along the deep channels since the shoals in San Pablo Bay and Suisun Bay significantly retard the tidal movement, acting like a wall (Wang 1998). Bottom friction strongly influences current speed. Currents generally follow contours of constant depth, and the tidal current magnitudes are proportional to the mean water depth (Walters et al. 1985), i.e., the shallower the water the greater the friction or drag on the movement of water.

Density currents are generated when two adjacent bodies of water have different densities. The different densities could be caused by differences in temperature and/or salinity. Colder and/or more saline water is denser than warmer and/or fresher water. In the Bay density differences are generally caused by differences in salinity. In stratified or partially mixed estuaries, such as the North Bay, density currents can be important in determining mixing.

The North Bay is a partially to well-mixed estuary with longitudinal variations in salinity between the Delta and the ocean. This longitudinal variation in salinity sets up a density-driven estuarine circulation. The circulation is the strongest when vertical mixing is the least. Therefore, the density flows are the weakest during spring tides due to enhanced vertical mixing (Walters et al. 1985). During neap tides the density-driven flows are the strongest and can dominate over tidal residual currents. Typical values for density-driven currents are about 15 cm/s in Carquinez Strait and San Pablo Bay and about 10 cm/s in the upper and eastern Suisun Bay (Walters et al. 1985).

4.6.2.3 Groundwater Resources

In the North Bay region, the principal groundwater-bearing aquifer is composed of alluvial deposits, which cover most of the Sonoma and Napa valleys. These aquifers are largely continuous, with general flow toward San Pablo Bay. In the region adjacent to the Bay, however,

local flow has been reversed as a result of groundwater extraction, leading to saltwater intrusion. Groundwater levels in the alluvial deposits vary locally, but are generally 5 to 75 feet below the ground surface.

The most significant natural recharge into alluvial aquifers occurs from rivers and streams. Generally, the alluvial deposits are not permeable enough to allow natural recharge from surface infiltration, although some limited recharge occurs through surface infiltration resulting from precipitation.

As the land elevation ascends into the Huichica mountain range, the groundwater aquifer changes because volcanic deposits are present. The Huichica formation is composed of reworked volcanic sediments that have a low specific groundwater yield. The low specific yield illustrates that this aquifer has lower productivity than alluvial deposits. The same soil conditions that limit productivity also limit recharge. The primary source of recharge is infiltration, usually through outcrops of the formation in the higher mountainous areas.

4.6.2.4 Surface Water Resources

Sacramento–San Joaquin River Delta

The volume and timing of fresh water flowing into the Estuary has changed considerably over the years. Reservoirs in the Central Valley limit the amount of inflow during winter and spring and increase the amount in the summer and fall. Fresh water has been diverted from both within the Delta and upstream to supply farms and cities.

The salinity near the Golden Gate is linked to the amount of discharge from the Delta. Delta discharges in the spring have decreased since 1932, most likely owing to upstream storage or diversion of the water. The spring discharge mainly corresponds to the Sierra snowmelt-runoff. The decrease in spring discharge over the years is consistent with the long-term rise of salinity near the Golden Gate.

The net flow of water upstream or downstream in an estuary depends upon several factors. Namely, tides, river inflow and diversions, and their interactions with wind and bathymetry. These factors also influence stratification in the estuary. Where the water is deep, such as in Carquinez Strait, net landward (up-estuary) bottom flows have been observed. In the shallower waters within Suisun Bay, net seaward (down-estuary) bottom flows were observed. Higher levels of stratification were also observed in deeper waters (SFEP 1997).

The “null zone” is classified as a location where no net landward or seaward flow of currents exists. The newest theory, as described in the *State of the Estuary Report* (SFEP 1997), is that the position of the null zone is dependent on both the movement of the salt field and the bathymetry of the estuary. Throughout most of the year a null zone occurs near the Benicia Bridge.

Napa River

The Napa River originates near Mount St. Helena (elevation 4,343 feet) and drains a 426-square-mile watershed located north of San Pablo Bay in Napa and Solano counties. The watershed is bounded to the west, north, and east by prominent ridges of the Central Coast Range and to the south by the marshlands bordering San Pablo Bay. However, most of the Napa River’s 50-mile

length occupies the relatively flat, low-lying lands of Napa Valley (elevation sea level to 400 feet). South of the city of Napa the river broadens as it winds through extensive marshlands and former salt ponds before it empties into San Pablo Bay near the city of Vallejo. Major tributaries include Dry, Redwood, Sulphur, Conn, Soda, Milliken, and Napa creeks.

Daily discharges in the Napa River vary both seasonally and annually. The average flow rate at the City of Napa gage (USGS gage no. 11458000) for the wettest month, February, is 697 cfs. During the driest month (September) the average flow is less than 2 cfs. Annual discharge from the Napa River varies markedly between dry and wet years. Average annual runoff for the Napa River is about 150,000 acre-feet at the City of Napa gage for the period on record (1929–1932 and 1960–2004). The region has experienced severe droughts and floods. For example, the total annual runoff during the driest water year on record, 1977, was only 525 acre-feet, whereas in wettest water year 1988, the runoff amounted to 425,000 acre-feet. The peak discharge of 37,100 cfs occurred in February 1986 with a corresponding river stage at 54.9 feet NGVD 29, resulting in unprecedented flooding. Consequently, the implementation of the Napa River Flood Management Plan was initiated in 1998 to reduce the flood levels. The project involves improvements in 6 miles of the Napa River between Highway 29 on the south and Trancas Street on the north, located to the north of the proposed NPSR project. It is designed to achieve protection against a 1 percent-chance occurrence flood (i.e., also referred to as a 100-year return period flood).

The Napa River, slough channel, and salt ponds in the proposed project area reflect a long history of water management. Beginning in the 1930s the Napa River was levied and dredged for flood protection and navigation. Channel maintenance has continued to the present day, though many flood control levees are being removed in favor of more ecologically sound flood management measures. Historically, the proposed project area was part of the river's floodplain and acted to naturally attenuate floods and serve as a sink for sediments. Existing salt pond levees restrict floodwaters and tides in the Napa River from accessing the site.

Flooding

The city of Napa and Napa County have a history of periodic flooding from the Napa River and Napa Creek for two primary reasons. The river was disconnected from its original floodplains by diking to protect adjacent urban development and secondly, the existing drainage system is inadequate to convey the flood flows. A dam was built on Conn Creek in 1944 following the recommendation of a study authorized by the federal government; however, it did not solve the flooding problem in Napa Valley because its impoundment was not managed for flood control. Between 1966 and 2002, Napa County residents have suffered a loss amounting to $542 million for property damage alone (Napa Flood and Water Conservation District 2003). The city of Napa has experienced 27 major floods over a 135-year period from 1862 to 1997, which is equivalent to a recurring period of approximately 5 years for major floods.

The Napa River Flood Management Plan, designed by the Community Coalition of Napa Flood Management and sponsored by the Napa County Flood Control and Water Conservation District, is a cooperative project to bring flood protection, watershed management, and environmental restoration to the entire Napa River Valley and economic revitalization to the city of Napa. The Napa County Flood Control and Water Conservation District is implementing a $250 million plan which provides flood protection through reconnecting the Napa River to its historical

floodplain and the restoration of over 650 acres of tidal wetlands of the San Francisco Bay Estuary while protecting 2,700 homes, 350 businesses, and over 50 public properties from 100-year flood levels. The implementation of this project requires substantial soil excavation and channel widening along approximately 6 miles of the Napa River. This project is financed by an increase in sales taxes to fund the local share of the project.

4.6.3 Project Setting

4.6.3.1 Tides

NOAA collects tide data in San Francisco Bay including in the proposed project area near the mouth of the Napa River, on the Napa River near Edgerly Island, and in the city of Napa. The Napa River near Edgerly Island station is closest to the proposed project site, located on the west bank of the Napa River opposite Pond 1. Table 4.6-2 lists tidal datums for tide stations near the proposed project site.

Slight amplification in the tidal signal occurs up-estuary from San Pablo Bay to the Napa River, as reflected by the progressive increase both in the mean range and diurnal range from the Mare Island Strait station to the station in the city of Napa. The tidal limit on the lower Napa River extends to about 0.25 mile upstream of Trancas Bridge near the city of Napa.

Table 4.6-2
Tidal Datums in the NPSR Project Vicinity

Tidal Datum	NAVD 88 (feet)
Mean Higher High Water (MHHW)	6.21
Mean High Water (MHW)	5.62
Mean Sea Level (MSL)	3.31
Mean Tide Level (MTL	3.28
Mean Low Water (MLW)	0.94
Mean Lower Low Water (MLLW)	0.08

Note: Elevations based on mean data from NOAA Station 9415415 (Edgerley Island, MLLW datum). Conversion from MLLW to NAVD 88 based on an interpolation between conversions documented at NOAA Stations 9415218 (Mare Island Naval Shipyard) and 9415623 (Napa River).

4.6.3.2 Fagan Slough

Fagan Slough, to the north of Ponds 9 and 10, is the major tidal slough on the east side of the Napa River in the vicinity of the proposed project. This slough provides tidal exchange to about 75 percent of Fagan Marsh. Steamboat Slough provides the remainder of the tidal exchange to the marsh. Fagan Slough has an approximate top width of 100 feet at the mouth.

Fagan Slough receives runoff from Napa County Airport, Fagan Creek, and No Name Creek. Fagan Creek drains an area of approximately 6.8 square miles located east of Napa County Airport. The Fagan Creek watershed is bisected by Jameson Canyon and bounded on the east by the Solano County-Napa County line. Elevations range from almost 1,500 feet in the northeast edge of the watershed to near sea level at the mouth.

No Name Creek drains an area of about 2.3 square miles east of the salt ponds and immediately southeast of Pond 10. The watershed is generally flat with a small rise on the east edge up to elevation 300 feet. The watershed drains through a ditch along the east side of Pond 10, then through a culvert into Fagan Slough.

Neither Fagan Slough, Fagan Creek, nor No Name Creek are gaged and, hence, no historical flow measurements are available.

4.6.3.3 Salt Ponds

Salt ponds in the proposed project area were historically tidal marsh and marsh ecotone. The alignments of historic slough channels can be seen in contemporary aerial photos of the site in the pickle ponds but not in the crystallizer beds. The historic slough channel alignments are not visible in the crystallizer beds because heavy equipment scrapes the pond bottoms during salt harvesting. The locations of the visible channels in the aerial photos align with those mapped in 1856 by the U.S. Coast & Geodetic Survey (Figure 1-2). It is hypothesized that these channels have filled with unconsolidated sediments, and would readily scour upon restoration of tidal circulation.

Water movement among salt ponds has historically been highly managed to maximize salt production. Pond operation for salt production operations and phase-out operations is discussed in Section 2.

4.6.3.4 Flooding

Figure 4-5 depicts the Federal Emergency Management Agency (FEMA) 100-year flood hazard zone in the vicinity of the proposed project (FEMA 1990). Many properties adjacent to the project site are currently within the FEMA 100-year flood hazard zone, including the adjacent vineyards and the Napa County Airport, which is a 2,045-acre general aviation airport located to the northeast of the proposed project site. The northeastern perimeter of the airport is bordered by Fagan Creek, which drains into the tidally influenced Fagan Slough. The area surrounding the airport consists of marshlands that have a tendency to flood during heavy rains.

4.6.4 Impacts and Mitigation

4.6.4.1 Impact Significance Criteria

The following standards of significance are based on CEQA Guidelines, Appendix G. For the purposes of this EIR, hydrology impacts are considered significant if implementation of the proposed project would:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that a net deficit in aquifer volume or a lowering of the local groundwater table would occur
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on-site or off-site

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map
- Place structures that would impede or redirect flood flows within a 100-year flood hazard area
- Expose people or structures to a significant risk of loss, injury, or death involving flooding

4.6.4.2 Analytical Methods

Several analytical methods were used to identify potential impacts of the proposed project on the water resources of the proposed project area. A detailed modeling study was conducted consisting of both one-dimensional and two-dimensional hydrodynamic modeling. A description of the modeling and the modeling results are contained in Appendix A. In addition, field data were collected including elevations of area levees and the salt ponds. Historic data were reviewed including FEMA Flood Insurance Rate Maps, historic bathymetry data (USCGS 1856), and empirical studies of existing wetland geometry (Williams et al. 2002).

4.6.4.3 Impacts and Mitigation Measures

The proposed project and project alternatives would not substantially deplete groundwater supplies or interfere with groundwater recharge such that a net deficit in aquifer volume or a lowering of the local groundwater table would occur. The proposed project does not involve any drainage systems and would not change existing drainage patterns or values. Also, the proposed project and project alternatives would not involve the construction of any new housing or other structures that could impact flood hazard areas. Therefore, these impacts are not discussed further in this section.

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

WR/HYD-1: Impact to existing drainage pattern	The proposed project would substantially alter the existing flow patterns on the site in a manner that would result in substantial erosion or siltation on-site or off-site.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: The existing drainage area for Fagan Slough is about 385 acres. The drainage area would be increased to about 550 acres by the breach in the Pond 9 levee. This increase in the drainage area would result in an increase in the tidal prism in Fagan Slough potentially increasing its size. Historically, Fagan Slough drained about 670 acres and varied in size from about 300 feet wide near its mouth to about 200 feet wide upstream (Figure 1-2).

Because of the decrease in tidal prism due to levees constructed to create the salt ponds the width of Fagan Slough has decreased from its historic value to about 100 feet wide. Breaching the Pond 9 and 10 levees would restore much of the tidal prism to Fagan Slough, thereby causing erosion in the slough and an increase in its size. Although the historic drainage area of Fagan Slough is probably larger in plan area than it would be after Ponds 9 and 10 are breached, Ponds 9 and 10 are lower in elevation than the historic wetland; therefore, it can be anticipated that Fagan Slough would increase in size to the order of its historic size. As Ponds 9 and 10 sediment in the tidal prism would decrease, siltation in Fagan Slough would result in a decrease in its size (Williams et al. 2002).

The increased flow in Fagan Slough has the potential to increase erosion in the Napa River across from the mouth of the Fagan Slough. This would occur if the flow out of Fagan Slough jetted across the River and impacted the opposite shore. Appendix A provides results from a two-dimensional model of the Napa River. The modeling results show that most of the additional flow goes down the middle of the river and there is only a small increase in velocity in the river across from the Fagan Slough mouth. The velocity does not increase enough to cause any additional erosion on the opposite bank.

Presently, the barge channel is a dead end channel that collects sediment. Cargill dredges the channel to keep it open for barges that are used to transport salt generated at the Napa Plant Site. Opening the wash ponds to tidal action would increase the flow in the barge channel. However, the tidal prism generated by opening the wash ponds would not be large enough to maintain the barge channel at its existing size of over 200 feet. The area of the wash ponds, 81 acres, would result in a channel that is about 70 feet wide and likely less than 10 feet deep (at MLLW) (Williams et al. 2002). Initially, the channel may be wider until the wash ponds fill with sediment. To maintain a boat launching facility, the launch ramp would need to be located near the breach location or possibly at the end of a dock that extends into the channel.

The erosion of Fagan Slough would result in an increase in sediment load to the Napa River. However, since the enlargement of Fagan Slough would occur over several years, the impact to the sediment load on the Napa River would be less than significant.

WR/HYD-2: Impact on flooding	The proposed project could expose people or structures to a significant risk of loss, injury, or death involving flooding.
Significance:	Potentially significant
Mitigation WR/HYD-2:	Close visitor center when Napa River is predicted to be at flood stage. Post escape routes to high ground on Green Island in Visitor Center.
Residual Significance:	Less than significant

Impact Analysis Discussion: The proposed project includes public access to the site to provide a variety of recreational and educational opportunities for the people of the region. Green Island, where the structures are located, varies in elevation from about 6 feet (NAVD 88) to over 10 feet. More than fourteen acres of the crown of Green Island are between 10 feet and 30 feet (NAVD 88) in elevation.. The FEMA flood elevation is about 9.6 feet. The lower areas of the island are those located closest to the river and barge channel. Therefore, some of the visitor

facilities maybe located in the flood inundation zone. However, they are located within a few hundred feet of those portions of the island that are above the flood inundation zone.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Water resource impacts and mitigation for Alternative 1 are essentially equivalent to the proposed project. Because Alternative 1 has no managed pond the tidal prism the South Unit would be larger than it would be for the proposed project, but this does not affect any of the water resources impacts.

ALTERNATIVE 2 - TIDAL RESTORATION OF MANAGED POND AND PLAYA

Water resource impacts and mitigation for Alternative 2 are essentially equivalent to the proposed project. There is no tidal action in the Central Unit in Alternative 2, therefore, depending on precipitation patterns the Central Unit could provide flood storage.

ALTERNATIVE 3 – NO PROJECT

Under Alternative 3 no change would occur to water resources of the proposed project area. The salt ponds would remain as ponds, which collect rainwater in the winter and would be dry in the summer. The levees would be maintained and the flood risk would remain the same as at present.

4.7 WATER AND SEDIMENT QUALITY

4.7.1 Sources of Information

Existing water quality conditions in the salt ponds at the site of the proposed NPSR project, the Napa River, and Fagan Slough were evaluated based on data collected at similar nearby sites, and on regional water quality data available in the literature. The Regional Setting section was taken directly from the *Napa River Salt Marsh Restoration Project. Final Environmental Impact Report* (NSMRP EIR) (CSCC and CDFG 2004). Specific sources of information include:

- 2004 Annual Self-Monitoring Report Fro South San Francisco Bay Low Salinity Salt Ponds (July 2004-December 2004), WDID NO. 2 019438001 (FWS 2004)
- 2004 Self-Monitoring Report-Baumberg Complex-Hayward, CA, WDID Number 2 019438001 (CDFG 2004)
- Habitat Restoration Monitoring for the Napa-Sonoma Marsh Restoration Project, October 2003 – June 2005 (Takekawa 2005)
- *Napa River Salt Marsh Restoration Project. Final Environmental Impact Report* (CSCC and CDFG 2004)
- Salinity Sampling Data (Ransom, pers. comm., 2005)
- *Site Investigation Report, Cargill Salt Napa Site and Baumberg Concentrator Ponds* (CH2M Hill 2003)
- *Site Removal Report, 2983 Green Island Road, American Canyon, California* (Treadwell and Rollo 2003)
- *Water Quality and Sediment Characterization, Napa River Salt Marsh Restoration Project* (HydroScience Engineers 2002)

The indented text in the following description of regional conditions is largely from the NSMRP EIR (CSCC and CDFG 2004) although some modifications have been made.

4.7.2 Regional Setting

The hydrologic processes and fate and transport factors for chemical constituents in San Francisco Bay, its tributary rivers, and adjacent estuaries are complex and result in dynamic water quality conditions. Water quality in the Bay-Delta estuary is largely a function of the mixing of ocean water and freshwater inflows from precipitation, the Delta, and other tributary streams. Water and sediment quality are affected by physical, chemical and biological processes. Heat, light and physical mixing of sediment, nutrients, and salts combine with primary and secondary productivity and by-products in the aquatic ecosystem of the bay. These ecosystem functions have secondary effects on dissolved oxygen, pH, and organic matter production and decay. In addition, the discharge of anthropogenic sources of conventional inorganic contaminants and trace metal and synthetic organic compounds also play a major role in the quality of bay water and sediments. Examples include treated municipal and industrial wastewater discharges and urban stormwater runoff.

4.7.2.1 Salinity (CSCC and CDFG 2004)

Salinity in the Bay-Delta estuary reflects a balance between the saline marine influence, freshwater dilution, and the effects of evaporation. Undiluted seawater has an average salinity of about 35 ppt and distilled fresh water is defined as having 0 ppt salinity. Estuarine or brackish water represents salinity that lies between pure freshwater and pure saltwater conditions. Saltwater is considerably more dense than fresh water; therefore, fresh water floats on top of saline water. The density difference between saline and fresh water conditions also influences physical mixing between water layers of varying density. In general, salinity is lower and has a greater seasonal variation in the northern portion of San Francisco Bay than in the southern portion, because San Pablo Bay receives substantially greater freshwater influx from the Delta. The salinity in the sloughs of San Pablo Bay varies seasonally. During periods of high fluvial outflow (particularly the winter rainy season), increased freshwater influx via San Pablo Bay's creeks decreases the salinity in the sloughs. Slough salinities increase during the summer low-flow period when freshwater influx is reduced.

The USGS and San Francisco Estuary Institute Regional Monitoring Program (RMP) conduct extensive water quality monitoring activities in San Francisco Bay and its freshwater tributaries (San Francisco Estuary Institute 1999, 2000a). The USGS operates a continuous salinity meter at Point San Pablo and has operated several continuous TSS recorders (e.g., Benicia Bridge, Carquinez Bridge, Point San Pablo) in recent years. Analyses indicate that salinity in San Pablo Bay varies over a wide range during the year from nearly fresh water to nearly pure sea water. Salinity also exhibits a distinct variation that correlates with the spring-neap tidal cycle with spring tides having greater energy to force seawater further into the estuary. The spring-neap tidal cycle is generally more pronounced in the North Bay.

4.7.2.2 Suspended Sediment (CSCC and CDFG 2004)

Like salinity, suspended sediment concentration is controlled by a balance of factors. Key influences on suspended sediment are loading from inland streams, tidal influences on dilution and mass loading of biotic suspended matter (algae, zooplankton), and resuspension of previously deposited sediments within the bay. Resuspension of sediments within the bay is a function of tidal currents, wind strength and direction (i.e., the strength of wind-driven wave currents), and freshwater inputs. Freshwater influx peaks during the winter (November–April) rainy season and land-derived sediment loading shows a corresponding winter peak. Tidal currents vary as a result of monthly neap and spring tidal cycles, with the greatest sediment mobility during spring tides.

In general, TSS concentrations are highest in the San Pablo Bay region and at the southern end of San Francisco Bay. TSS concentrations are typically lower in central San Francisco Bay. USGS data show average concentrations of ~80–150 milligrams per liter (mg/l) in San Pablo Bay (Northwest Hydraulic Consultants 2001). High TSS concentrations in San Pablo Bay are generally associated with sediment input associated with Delta inflows.

Measured TSS concentrations range from relatively low values of less than 50 mg/l TSS to very turbid conditions exceeding 1,000 mg/l TSS. Seasonal RMP grab samples also indicate that TSS concentrations are generally elevated in the Napa and Petaluma Rivers compared to San Pablo Bay (San Francisco Estuary Institute 2000a). However, the total sediment transport from the upper watersheds is minimal compared to the quantities of sediment derived from Delta outflow

and wind- and wave-driven resuspension of bay sediments. In addition, Warner (2000) identified a complex tidally and salinity driven mechanism that acts to increase TSS transport into Mare Island Strait and the lower Napa River from the Carquinez Strait. Essentially, the earlier timing of flood tides with high TSS levels into Mare Island Strait compared to the Carquinez Strait provides high TSS conditions, and the convergence with lower salinity Napa River outflow creates a standing wave that allows elevated deposition rates.

4.7.2.3 Priority Trace Metal and Organic Compounds in Water and Sediment (CSCC and CDFG 2004)

Water

Water and sediment contamination from priority trace metal and synthetic organic compounds in the San Francisco Bay area largely reflects the influence of past and present agricultural and mining activities, industrial uses, and urban development (San Francisco Estuary Institute 1999). Contaminants known to be present in waters and sediments of the Bay-Delta estuary include heavy metals (lead, copper, aluminum, mercury, nickel, vanadium, chromium, silver, zinc), PAHs, PCBs, chlorinated hydrocarbon pesticides, and tributyltin (San Francisco Estuary Institute 1999, 2000a, San Francisco Bay RWQCB 1998).

Within the North Bay region, constituents of concern that routinely exceed numeric guidance levels, human health guidelines, and/or regulatory concentration criteria in water samples collected for the RMP monitoring program include copper, mercury, and PCBs (San Francisco Estuary Institute 2000a). For the Napa River and San Pablo Bay samples, only copper exceeded applicable criteria on an average basis; however, individual measurements of mercury, copper, nickel, chromium, lead, and zinc exceeded criteria on one or more occasions (San Francisco Estuary Institute 1999). Organic compound concentrations of PCBs and dichlorodiphenyldichloroethelene (DDE) were also measured above water quality guidelines at least once in the Napa River and San Pablo Bay. The sum of 40 PCB congeners was well above the congener-based total-PCB criterion of 170 picograms per liter (pg/l) in all but eight of the RMP sampling locations. While the concentrations of PCBs have dropped since the 1970s, the RMP monitoring data have shown no clear trends in recent years. Measured exceedances of metals and organic compounds occurred less frequently in other North Bay sampling locations (i.e., Davis Point, Pinole Point).

The sources and magnitude of contaminant loading to San Francisco Bay have been recently characterized as consisting primarily of the following categories: Central Valley via Delta inflows, local runoff of rivers and stormwater runoff, point-source discharges to the bay from municipal and industrial facilities, atmospheric deposition, and dredged material disposal (San Francisco Estuary Institute 2000b). Overall, the report indicated that TSS and contaminant influxes from the Delta comprise a large majority of the total loading in San Francisco Bay. Atmospheric deposition and dredged material disposal represent relatively small contributions.

The relative magnitude of contaminant loading from local watershed sources and point-source discharges depends on the particular chemical constituent in question. For example, point-source discharges comprise the majority of inorganic nutrient (nitrogen [N] and phosphorus [P]) loading to San Francisco Bay, whereas trace metals inputs are primarily associated with local watershed sources. Relative source contributions of organic compounds have not been determined. Within

the category of local watershed runoff, the Napa River, Petaluma River, and Sonoma Creek watersheds were found to contribute a relatively high percentage of the total San Francisco Bay area load of selected trace metals (cadmium, chromium, copper, lead, nickel, and zinc) compared to other watersheds.

Sediment

RMP monitoring data for 1993–1999 average sediment constituent concentrations in the Napa River and San Pablo Bay indicate that both water bodies exceed one or more guidance criteria for arsenic, chromium, copper, mercury, nickel, and total dichlorodiphenyltrichloroethane isomers (DDTs) (San Francisco Estuary Institute 1999, 2000a). RMP data for the Napa River indicate that mercury, PCBs, total DDTs, arsenic, copper, and chromium exceeded sediment guidelines in more than 90% of the samples collected from 1993 to 1999 (San Francisco Estuary Institute 2000a). San Pablo Bay sediment also exceeds criteria for total PAHs. The former Mare Island Naval Shipyard is also a potential point source of TBT, a highly toxic endocrine-disrupting chemical used as an antifoulant in ship paints. Sediment toxicity tests have also frequently been positive for Napa River samples; Davis Point samples have tested positive for sediment toxicity much less frequently.

Mercury Dynamics in an Estuary

Mercury contamination is widespread in sediments and waters of the San Francisco Bay area (San Francisco Estuary Institute 2000a, San Francisco Bay RWQCB 2000). Mercury is a constituent of particular concern to wetland restoration projects because of its ability to convert to the methylated form of the metal, which is relatively more mobile in the aquatic environment than other forms. As explained in more detail below, the sulfate reducing bacteria typically associated with marsh sediments methylate mercury as part of their respiration process, making it more bioavailable to aquatic life. Therefore, upland sediments containing sediment bound mercury can become a source of methyl mercury when exposed to tidal action.

Long-term RMP monitoring data for total mercury in water and sediment has consistently shown elevated concentrations, primarily in the North and South Bay areas and river tributaries. There is also a strong correlation between total mercury and suspended sediment transport in the water [San Francisco Estuary Institute 2002]. Elevated mercury levels are in large part a legacy of the California gold mining era, when mercury was used in the gold refining process. Mines such as south San Francisco Bay's New Almaden Mine are known to be a source of mercury in the South Bay. Mercury can be delivered to the San Pablo Bay system via the Delta.

In aquatic environments, most mercury is chemically bound to suspended particles of soil or sediment; a smaller fraction is bound to dissolved organic carbon. Sediment-bound mercury may be available to aquatic organisms and is thus a pollutant of concern; the potential for adverse environmental effects from sediment-bound mercury depends primarily on transport and depositional characteristics (e.g., particle size) and on the physical and chemical properties of the sediment.

Additionally, sediment-bound mercury may be converted through both biotic and abiotic processes to its more bioavailable methylated form. Factors conducive to methylation of mercury include low-flow or stagnant waters, hypoxic or anoxic conditions in the water or sediment column, low pH (pH<6), and high concentrations of dissolved carbon. Most of these factors are

in turn affected by biological processes such as metabolism, growth, and decay; for example, mercury methylation has been linked to the activity of sulfate-reducing bacteria in the shallow anoxic sediment column.

Aquatic plants, fish, and wildlife readily adsorb methyl mercury. It can then accumulate in their tissues, creating contaminated food sources (plant or animal tissues) that transfer through the food web (Santa Clara Valley Water District and U.S. Army Corps of Engineers 2001). It is a mutagen, teratogen, and carcinogen, and has embryotoxicological, cytochemical, and histopathological effects. In aquatic organisms, concentrations of 0.1–200 µg/l have been shown to produce adverse effects; chronic toxicity has been shown to increase with the age of the organism, exposure time, temperature, lowered salinities, and the presence of other metals. Acute toxicity to embryonic development is associated with methyl mercury.

4.7.2.4 Treatment Plant Discharge (CSCC and CDFG 2004)

Wastewater treatment plants (WWTPs) are monitored as point sources of pollution, and most plants in the North Bay region are converting to tertiary treatment to meet increasingly stringent discharge permit requirements. The WWTPs in the North Bay region discharge recycled water to area waterways only during the wet season. The Napa Sanitation District (NSD) WWTP discharges to the Napa River 2.7 miles upstream from the proposed project area and the City of American Canyon WWTP discharges into the North Slough and adjacent constructed wetlands.

In general, the WWTPs produce effluent that has moderate inorganic mineral content with low suspended solids and turbidity relative to the natural background conditions in the Napa River and San Pablo Bay. The pH values are neutral, and along with ammonia and whole effluent toxicity test data, the effluent usually is in compliance with regulatory permit limits.

High analytical detection limits used for some of the trace metals preclude comparisons with applicable Basin Plan water quality objectives. However, NSD effluent discharge generally contains low concentrations of copper and mercury, which are listed on the 303(d) list as substances responsible for the impairment of San Pablo Bay. These substances are considered in the NPDES permits issued by the San Francisco Bay RWQCB, although the allowable discharge levels could change when the Total Maximum Daily Load evaluation process is complete.

4.7.2.5 Napa River

The Napa River drains a 426-square-mile watershed located northeast of San Pablo Bay. The water quality of the Napa River was assessed as part of the NSMRP. A sampling program was implemented in October-November 2001. Samples were collected from the Napa River near the State Highway 37 crossing, from Napa Slough approximately 1 mile from its confluence with the Napa River, and from San Pablo Bay near the mouth of the Napa River. The results of analyses for general water quality parameters are shown in Table 4.7-1. The data present an indication of the water quality in three areas; however, these parameters may exhibit significant spatial and temporal variability.

Table 4.7-1
Regional Water Chemistry Data (2001)[1]

Parameter	San Pablo Bay	Napa River	Napa Slough
Total Ammonia as N (mg/L)	0.3	0.3	0.5
Un-ionized Ammonia as N (mg/L)[2]	0.004	0.005	0.011
Nitrate as N (mg/L)	0.2	0.3	0.4
Organic N (mg/L)	0.7	20.2	2.4
Total Phosphorous (mg/L)	0.7	NM	ND
pH	7.7	7.7	7.8
Biochemical Oxygen Demand (mg/L)	NM	NM	68
Turbidity (NTU)	7.8	20.1	8.1
Total Suspended Solids (mg/L)	26	72	20
Total Dissolved Solids (ppt)	24	20	20
Chloride (ppt)	14	11	12
Dissolved Oxygen (mg/L)[3]	8.1	8.0	7.2
Temperature (ºF)[3]	62	62	60
Fecal Coliform (MPN/100mL)	50	500	50

Notes:

ND = Not detected NM = Not measured NC = Not calculated

[1] All data are from laboratory analysis of single grab samples unless otherwise noted

[2] The un-ionized fraction of ammonia N was calculated using a relationship developed by Emerson et al. (1975).

[3] Field measurement.

4.7.2.6 Fagan Slough

Fagan Slough is tributary to the Napa River approximately 300 feet north of the proposed project site. Sampling data are not available for Fagan Slough; however, water quality data for Napa Slough, provided above, are likely to provide a general understanding of the existing condition in Fagan Slough. Nonpoint source flows from the Fagan Creek watershed may affect water and sediment quality in Fagan Slough. Land uses in the drainage area include Fagan Marsh, Napa County Airport, and agriculture.

4.7.2.7 Salt Ponds

Pond Water Quality: Regional salt pond water quality data are useful for anticipating water quality characteristics likely to be found in the ponds of the proposed NPSR project. At the NSMRP site across the river, the most highly concentrated ponds, in terms of salinity, have historically been Ponds 7, 7A, and 8. Water was moved from Pond 8 to the pickle ponds in the proposed project site. Pond 4 preceded Ponds 7, 7A, and 8 in the concentration process and consequently had lower salinity. Pond 7 served as bittern storage (i.e., discharge from crystallizers at the plant site) and had very high salinity.

Table 4.7-2 shows results of water quality analyses for samples collected October 1 and 2, 2003, by HydroScience Engineers from Ponds 4, 7, 7A, and 8 at the NSMRP site. The methods used by the analytical laboratory were adapted from standard methods to reduce interference caused by high salinity in the samples. The table compares salt pond water metals concentrations with U.S.

Environmental Protection Agency (EPA) and Bay Area water quality standards. Copper, nickel and zinc were found to be in excess of water quality criteria in some ponds. Copper and nickel also exceeded criteria in Napa Slough, indicating a regional water quality issue.[1] These exceedances are not thought to constitute a water quality problem for biota because the metals are complexed with organic compounds in the local waterways. Pond 7 has concentrations that exceed water quality criteria and would have the potential to cause toxicity depending on the discharge rate and mixing characteristics in the river. The desalination plan for Pond 7 has addressed this issue by requiring extensive dilution prior to discharge to Napa Slough.

Table 4.7-2
Total Recoverable Metals in Water Samples Collected from the NSMRP Site[1]

Constituent		Water Quality Criterion[2]	Effluent Limitations[7]	Napa Slough	Pond 4	Pond 7	Pond 7A	Pond 8
Salinity	ppt	~	~	18.6	37.5	396	47.8	21.4
Arsenic	µg/L	36[3]	20	1.74	2.53	9.62	3.75	0.81
Cadmium	µg/L	0.76[6]	10	0.099	0.038	< 0.020[8]	0.037	0.041
Chromium[9]	µg/L	270[6]	11[10]	< 0.40	< 0.40	50.3	48.4	23.9
Copper	µg/L	3.2[5]		4.14	1.51	4.34	0.79	1.34
Lead	µg/L	19[6]		0.67	1.05	2.81	< 0.20	0.31
Mercury	µg/L	0.025[4]		0.00575	0.00626	0.0183	0.00422	0.00262
Nickel	µg/L	7.1[3]		6.17	8.7	90	7.80	4.40
Selenium	µg/L	5.0[6]		0.144	0.160	1.22	0.175	0.090
Silver	µg/L	1.2[4]		< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Zinc	µg/L	58[3]		4.21	2.82	560	3.51	2.31

Notes:

[1] Analyses performed by Frontier Geosciences, Seattle, Washington
[2] Water Quality Criteria are expressed as total recoverable metals, using default EPA translators.
[3] Basin Plan Criteria for chronic effects in salt water
[4] Basin Plan Criteria for chronic effects in fresh water
[5] California Toxics Rule, salt water
[6] California Toxics Rule, fresh water
[7] Effluent Limitations for Shallow Water Discharges are taken from Table 4-3 of the Basin Plan, and are expressed as total recoverable metals.
[8] For ND analytical results, the value shown as "less than" is Frontier's laboratory reporting limit.
[9] Analytical results for chromium are expressed as the dissolved fraction. The dissolved chromium WQC for Chromium III is 270 µg/L, as set forth in the California Toxics Rule, freshwater, continuous.
[10] 11 µg/L as Cr VI; may be met as total chromium.

Pond Discharge Salinity: Extensive 1-dimensional modeling of a simulated breach of the levee of Pond 4 on the west side of the Napa River was performed during the planning stages of the NSMRP (PWA et al. 2002). The depth-averaged model assumed an initial salinity of 100 ppt in Pond 4, an abrupt discharge to the Napa River through a 50-foot levee breach, high water level in the pond, and high volume of flow in the Napa River. The pond discharge modeled was significantly greater than any likely discharge from the proposed project's managed pond.

The model results indicated a depth-averaged increase in the Napa River salinity of about 20 ppt in the breach vicinity, and an increase of 10 to 12 ppt over a 2-km reach. After approximately

[1] The San Francisco RWQCB is proposing new site-specific criteria for copper and nickel for the North Bay that accounts for lower toxicity in these waters due to complexation with organic compounds.

1 week, impacts were expected to decrease to approximately 5 to 10 ppt, but cover a 6-km reach of the Napa River. River salinity in the model returned to pre-breach conditions after approximately 1 month.

The assumption of depth averaging is important in interpreting these results, because density differences between the pond discharge and receiving waters would be expected to lead to greater salinity increases near the river bottom (compared to the depth-averaged model discussed above), and smaller salinity increases near the river surface. The reduced salinity impacts in the near-surface zone would provide connectivity between low-salinity waters and be more protective of fish.

It is also important to remember that, during the dry season, the salinity of the Napa River is approximately 15 to 20 ppt, and during the wet season, the salinity of the Napa River decreases to approximately 0 to 1 ppt. The model suggests that a discharge of high (approximately 100 ppt) salinity water from the ponds during the wet season would result in the salinity of 2 km to 6 km sections of the Napa River to levels similar to those found during the dry-season for a period of a few weeks. The modeling also showed that a lower salinity zone develops quickly inside the pond around the breach. Thus, higher salinities in the pond are "pre-mixed" prior to discharge. It is expected that this phenomenon would also occur at the project site, if pond salinities exceed ambient Napa River salinities by a measurable amount.

4.7.3 Project Setting

4.7.3.1 Salt Pond Water Quality

A comprehensive, site-specific program of surface-water sampling has not been conducted at the proposed project site, because the site is still managed by Cargill as described in the Phase-out Operations description in Section 2. Water quality in the ponds changes significantly through the year when salt production is ongoing. Cargill measures salinity in the ponds routinely. Historically, the salinity of the water in the pickle ponds (Ponds 9, 10, Unit 3, B-1, B-2, and B-3) has varied through an annual cycle, reaching a high in the late summer and a low in the late winter. Cargill has been working on reducing the salinity in these ponds as part of the phase-out operations. Figure 4-1 illustrates salinity trends in the six pickle ponds over the period between March 2003 and April 2005. The data over this period suggest a pattern of generally decreasing salinity in the pickle ponds.

4.7.3.2 Salt Pond Sediment Quality

At the request of Cargill, Phase One Environmental Site Assessment work was conducted at the site in 2000 and 2002, to investigate past and existing conditions at the site, and determine whether any known or observable condition would indicate that a recognized environmental condition might exist. A recognized environmental condition could include releases of hazardous materials, petroleum, or hazardous waste from such sources as leaking underground storage tanks. A Phase Two Site Investigation characterized all areas of the proposed project site, including upland areas as well as the ponds (CH2M Hill 2003). As part of the Phase Two Site Investigation soil samples were collected in September–October 2002 at locations shown on Figure 4-4.

All analytical results for soil samples collected from the ponds were compared to two sets of assessment criteria:

- *Interim Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse* (Wolfenden and Carlin 1992)
- *Draft Staff Report – Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (San Francisco Bay RWQCB 2000) (2000 Draft Guidelines), which presents proposed updates to the 1992 Criteria.

Pond sediment metal concentrations are influenced by local geological conditions and variability as well as salt making processes. Table 4.7-3 summarizes the results of soil sampling for the ponds. No metals were detected at concentrations exceeding any of the soil/sediment assessment criteria in either the 1992 criteria or the 2000 Draft Guidelines, with the exception of cadmium, discussed below.

Cadmium levels were well below the 1992 criteria, but soil samples from 4 of the 13 ponds exhibited concentrations of 0.34 or 0.35 mg/kg dry weight, which exceeds the 2000 Draft Guidelines criterion for wetland surface material of 0.33 mg/kg. By comparison, sediment samples collected from the Napa River and Napa Slough in October–November 2001 contained 0.4 and 0.5 mg/kg, respectively, values that also exceed the same criterion (HydroScience Engineers 2002). The results of both sampling efforts suggest that the local soils in the lower Napa River vicinity are characterized by cadmium concentrations slightly above the 2000 Draft Guidelines criterion for surface material, which is based on the estimated cadmium concentration in fine-grained sediments found in the San Francisco Bay area.

Samples collected from three ponds yielded detections of phenolic compounds (4-methylphenol and/or phenol) of less than 1 part per million. Two of the four detections were flagged as being quantified above the method detection limit, but below the practical quantitation limit; these two measurements are interpreted as estimated values. The soil/sediment evaluation criteria do not present criteria for the two semivolatile compounds detected. No other organics were detected in pond soil samples on the proposed NPSR project.

Future Sampling: A sampling program has been designed by DFG to document pre-project total and methyl mercury concentrations in sediment and water at the proposed project site. It is anticipated that the samples will be collected and analyzed by a laboratory during 2006. Samples will be collected and composited from multiple locations in each pond or group of ponds. This baseline data will be available for comparison with post project concentrations at the Napa Plant Site. In addition, the data will be available for comparison with data collected at other salt pond restoration projects including the NSMRP located across the river and data collected for the South Bay Salt Pond Restoration Project. The San Francisco Estuary Institute web site (http://www.sfei.org/rmp/mercury_newsletter/HgNews10_06_04.htm#section_3) contains descriptions of numerous mercury monitoring programs including a study monitoring mercury concentrations in sediment, biota, and water in five marshes along the Petaluma River in the North Bay and a study to identify wetland design and management options for control of mercury in San Francisco Bay.

Table 4.7-3
Results of Pond Soil Analyses and Sediment Screening Criteria

METALS (mg/kg dry weight)[1]	2000 Draft Guidelines		1992 Criteria		WP-1	WP-1 dup	WP-2	WP-3	PP-1[6]	PP-2[6]	PP-3[6]	CB-1[6]	CB-2[6]	CB-3[6]	CB-4[6]	CB-5[6]	CB-6[6]	CB-7[6]
	Wetland Foundation Material[2]	Wetland Surface Material[3]	Wetlands Noncover[4]	Wetlands Cover and Levee Maint.[5]														
Antimony (Sb)	none	none	none	none	<1.4	<1.4	<1.4	<1.4	<1.5	<1.4	<1.3	<1.4	<1.3	<1.4	1.9	<1.5	<1.3	<1.4
Arsenic (As)	70	15.3	85	33	9.2	6.8	6.1	6.3	6.8	6.1	9.3	3.9	3.2	5.8	5.9	9.0	3.8	8.7
Barium (Ba)	none	none	none	none	37.3	37.1	71.4	31.3	23.4	59.3	27.7	23.3	140	22.1	20.1	22.2	22.8	22.0
Beryllium (Be)	none	none	none	none	0.21	0.18	0.31	0.17	0.24	0.25	0.40	0.24	0.22	0.17	0.26	0.36	0.23	0.32
Cadmium (Cd)	9.6	0.33	9	5	0.34	0.39	0.34	0.30	0.35	0.24	0.24	0.34	<0.19	0.30	0.22	0.30	0.22	<0.20
Chromium (Cr) (total)	370	112	300	220	35.1	30.9	38.0	28.2	24.2	22.6	45.5	44.8	25.1	33.4	45.0	28.3	45.7	38.1
Cobalt (Co)	none	none	none	none	3.4	3.4	4.2	3.2	3.7	3.5	4.3	3.7	2.6	2.8	4.3	8.6	4.5	13.4
Copper (Cu)	270	68.1	390	90	7.2	7.2	15.1	9.1	11.1	9.5	14.2	18.1	10.5	13.6	15.5	13.6	14.2	16.5
Lead (Pb)	218	43.2	110	50	3.5	3.0	6.3	3.2	5.8	3.5	6.0	2.3	2.4	3.9	<2.3	6.4	3.6	2.6
Mercury (Hg)	0.7	0.43	1.3	0.35	0.03	0.03	0.04	0.03	0.03	0.03	0.14	0.03	0.02	0.02	0.02	0.05	0.02	0.03
Molybdenum (Mo)	none	none	none	none	2.4	2.1	2.8	1.9	2.0	1.7	0.83	2.3	0.37	2.4	2.4	1.5	1.5	6.8
Nickel (Ni)	120	112	200	140	23.7	21.2	29.3	21.1	21.7	22.8	29.1	24.8	19.1	19.4	27.5	41.8	27.4	34.8
Selenium (Se)	none	0.64	1.4	0.7	<0.40	<0.39	<0.40	<0.38	<0.40	<0.40	<0.39	<0.39	<0.40	<0.40	<0.41	<0.39	<0.40	<0.39
Silver (Ag)	3.7	0.58	2.2	1	<0.29	0.31	<0.29	0.38	<0.31	<0.30	<0.29	0.39	0.29	<0.29	<0.32	<0.32	<0.29	<0.31
Thallium (Tl)	none	none	none	none	0.13	<0.10	0.12	0.11	<0.10	0.10	0.10	0.12	0.19	0.12	0.21	0.12	0.17	<0.10
Vanadium (V)	none	none	none	none	33.9	31.4	36.3	26.7	24.1	24.1	35.8	39.8	24.4	34.5	37.8	31.5	37.8	41.1
Zinc (Zn)	410	158	270	160	28.4	26.0	31.0	25.6	22.9	21.0	35.8	27.1	16.6	25.0	53.8	42.3	29.8	24.2
SVOC s (µg/kg wet weight)																		
4(3) Methylphenol	none	none	none	none	<330	<330	450	<330	<330	<330	<330	<330	<330	<330	<330	290 J	<330	<330
Phenol	none	none	none	none	<330	<330	<330	<330	<330	<330	65 J	<330	<330	<330	<330	730	<330	<330

Notes:

All soil metals evaluation criteria are expressed on a dry-weight basis. All organics are reported in a wet-weight basis.

1 Results of metals analyses are reported on a dry-weight basis in this table; data provided in the Site Investigation Report, Volume III (CH2M Hill, 2003).
2 Value listed in Table 4, based on the Effects Range-Median value developed by Long et al. (1995), unless otherwise noted.
3 Value listed in Table 4, based on ambient background concentrations measured in fine-grained San Francisco Bay sediments, unless otherwise noted.
4 Based on the Effects Range-Medium value developed by Long et al. (1995), unless otherwise noted.
5 Based on the Effects Range-Low value developed by Long et al. (1995), unless otherwise noted.
6 Sample PP-1 was collected from Pond 9. Sample PP-2 was collected from Pond 10. Sample PP-3 was collected from Unit 3. Sample CB-1 was collected from crystallizer bed (CB) 3. Sample CB-2 was collected from crystallizer bed 4. Sample CB-3 was collected from crystallizer bed 2. Sample CB-4 was collected from crystallizer bed 1. Sample CB-5 was collected from crystallizer bed 7. Sample CB-6 was collected from crystallizer bed 9. Sample CB-7 was collected from crystallizer bed 6.

J - Estimated value. Detected at a concentration greater than the method detection limit, but less than the practical quantation limit.
<# - Not detected above laboratory reporting limit

References

1992 Criteria: San Francisco RWQCB adopted these criteria on November 18, 1992: Resolution 92-145, *Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse*.
2000 Draft Guidelines: San Francisco RWQCB published these draft guidelines in May 2000: *Draft Staff Report, Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (San Francisco RWQCB 2000).

4.7.3.3 Upland Areas

The proposed project site contains approximately 42 acres of upland area. Various structures and equipment associated with salt production operation exist in these upland areas, as well as one residence. Barge channel dredged materials are stockpiled in WP-1 and on upland areas east of the barge channel. Dredged materials were characterized from three samples collected in the fall of 2002 (CH2M Hill 2003) from two boring locations, BCD-01 and BCD-02, shown on Figure 4-4. Sample results were compared with San Francisco Bay RWQCB's Risk-Based Screening Levels (RBSLs) for surface soil where groundwater is not a current or potential source of drinking water. Concentrations of arsenic and chromium in some samples were above RBSLs. PCBs and TPH-g were below detection limits. Low concentrations of TPH-d and TPH-mo were detected.

Phase One and Phase Two Environmental Site Assessment work conducted in other portions of the upland areas of the proposed project site are discussed in Section 4.6, Hazardous Materials.

4.7.3.4 Managed Pond Water Quality

There is a managed pond component associated with the proposed project. As mentioned in Section 2 of this report, the managed ponds would contain water year round, which would be maintained at a depth of approximately 2-3 feet to facilitate bird habitat. Data from 2004 in the South Bay suggests that there is a potential for low dissolved oxygen issues associated with restored marsh managed ponds (FWS 2004 and CDFG 2004). However, 2005 data from the USGS (Takekawwa 2005) shows that ponds within the NSMRP site did not exhibit particularly low concentration of DO. Most ponds showed DO concentrations above 5 mg/L. Proper design engineering and operational management of flow through type ponds can decrease the potential for low DO issues to occur in managed pond systems. The goal is to reduce flow short-circuiting (stagnant areas), allow for wind generated wave action, and to reduce other factors that can lead to algae growth (high nutrients, etc.).

4.7.4 Impacts and Mitigation

4.7.4.1 Impact Significance Criteria

For purposes of this EIR, the following criteria are used to determine if an impact to water quality is significant:

- If an impact has potential to cause or contribute to an excursion beyond a water quality standard included in the Basin Plan.
- If an impact will degrade water quality such that a beneficial use is curtailed, or a susceptible plant/animal is harmed, or habitat is degraded.

For purposes of this EIR, the following criteria are used to determine if an impact to sediment quality is significant:

- If an impact will degrade sediment quality such that a beneficial use is curtailed, or a susceptible plant/animal is harmed, or habitat is degraded.

4.7.4.2 Analytical Methods

The potential for impacts to water and sediment quality that could occur if the salt ponds were restored to tidal marsh, managed ponds, or playa ponds was assessed by comparing the existing condition (salt-making ponds) to the projected conditions under the proposed restoration alternatives, and to the No Project Alternative. Projected conditions likely under the three restoration alternatives were assumed to be similar to conditions that developed at other former salt pond sites already in the process of restoration to tidal marsh and/or managed ponds. The projected long-term characteristics considered in the analysis included salinity, turbidity, dissolved oxygen, temperature, metals, and anthropogenic contaminants in both the pond waters and in the receiving waters of the Napa River and Fagan Slough.

4.7.4.3 Impacts and Mitigation Measures

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

WA/SED-1: Stormwater contamination and discharge	Implementation of the proposed project could result in discharge of contaminated stormwater during construction.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Stormwater may carry suspended solids, nutrients, and priority pollutants into the adjacent water bodies (the Napa River or Fagan Slough). Stormwater entering the Napa River or Fagan Slough could increase the level of biochemical oxygen demand in the receiving water. The Basin Plan establishes allowable levels of these constituents in the Napa River and Fagan Slough. Causing or contributing to an excursion beyond the allowable levels is considered significant. Construction will be completed during the dry season, minimizing the potential for a discharge from the site with one possible exception. If coffer dams are used to sequester the breach areas then there may be seepage that needs to be treated or disposed of as stipulated in the SWPPP. As part of the proposed project, a Stormwater Pollution Prevention Plan (SWPPP) and a Stormwater Monitoring Program will be developed and implemented. The Clean Water Act, National Pollutant Elimination System (33 United States Code 1342) requires that construction projects disturbing more than 1 acre of land must develop and implement a SWPPP. Implementation of the Best Management Practices in the SWPPP will reduce the impacts of stormwater leaving the site to less than significant.

WA/SED-2: Impacts to receiving water salinity	Implementation of the proposed project could result in an increase in salinity in the Napa River or in Fagan Slough.
Significance:	Potentially significant
Mitigation WA/SED-2:	Impacts to the Napa River will be minimized by constructing the proposed project while the ponds are dry and by controlling the timing, rate, and concentration of discharges from the managed pond. The proposed project would avoid discharging water from

the managed pond to the Napa River in an abrupt manner, during low flow in the Napa River, and when managed pond salinity is greater than 100 ppt. Discharge from the managed pond will be minimized during salmonid migration in the river from December 1 through April 30.

Residual Significance: Less than significant

Impact Analysis Discussion: The Basin Plan establishes narrative water quality objectives for salinity in the Napa River and Fagan Slough. The water quality objective is to avoid increasing salinity to the point where an adverse effect on beneficial uses, particularly fish migration and estuarine habitat, is created. Causing or contributing to an adverse effect due to high salinity is considered significant. The proposed project will comply with Waste Discharge Requirements and or a National Pollution Discharge Elimination System (NPDES) permit for the managed pond discharge issued by the Regional Water Quality Control Board.

There are two potential impact cases to consider: directly after breach construction (time zero) and during normal operation of the tidal restoration.

Time Zero: The tidal ponds would be dry when the levees are breached and tidal exchange is initiated.

During Normal Operation: No salinity impacts on the Napa River or Fagan Slough are expected from fully tidal ponds.

During normal operations water from the Napa River will enter the ponds where it will be exposed to the saline soils on the pond bottoms. Salt from these soils can diffuse into the tidal waters and thereby increase the salinity of the water that leaves the ponds on a falling tide. Soil and water samples were collected from Ponds 9 and 10 to estimate the potential to increase the salinity of water discharging from the salt ponds after they are breached. A discussion of the field program and analysis is provided in Appendix A.

The analysis indicated that the increase in salinity of the water in the ponds during a tide cycle should be less than about 1 ppt. For comparison, the salinity in the rainwater that collected in the ponds this winter was about 15-16 ppt about 2 months after the first rains.

During normal operation, the managed ponds would draw in river water to meet depth objectives, and would periodically discharge to the river for flushing or water level management. Salinity within the managed ponds may increase above the influent river concentration due to (1) precipitated salt on the pond bottom redissolving into the water column; and (2) evaporation during non-flushing periods causing a rise in salt concentration. It is not known how much precipitated salt will remain when DFG assumes management of the site. Solution kinetics will be the primary factor determining the rate at which precipitated salts would redissolve. Wind/wave action will increase the dissolution rate. Certain precipitated compounds redissolve slowly or not at all, which would attenuate the potential for salinity of incoming water to increase while in the ponds. In addition, those precipitated salts which are relatively insoluble may form a crust in places, which would also tend to decrease the dissolution rate.

Potential for raising the salinity of the Napa River at the discharge point of the managed ponds could be minimized by limiting the magnitude of discharges and lengthening the duration of

release. Discharge from the managed pond will be minimized during salmonid migration in the river from December 1 through April 30.

WA/SED-3: Impact to general water quality parameters	Implementation of the proposed project could result in adverse effects on other general water quality parameters in the Napa River or Fagan Slough.
Significance:	Potentially significant
Mitigation WA/SED-3:	Compliance with a Waste Discharge Requirements or an NPDES permit that may be issued for managed pond operation
Residual Significance:	Less than significant

Impact Analysis Discussion: General water quality parameters that could be impacted include total suspended solids, dissolved oxygen, nutrients (nitrogen and phosphorous), biochemical oxygen demand, temperature, and pH. The Basin Plan establishes allowable levels of these parameters in the Napa River and Fagan Slough. Causing or contributing to an excursion beyond the allowable levels is considered significant.

Tidal Area: No significant impact is expected and no mitigation is expected to be required for the tidal areas. Waste Discharge Requirements can be waived for tidal marsh restoration projects.

Managed Pond: Early experience at the South Bay Salt Pond restoration site suggests that circulation patterns in managed ponds with less than full tidal exchange may leave dead zones where water quality parameters can trend outside regulatory water quality goals, especially for dissolved oxygen. DFG will comply with Waste Discharge Requirements or an NPDES permit that may be issued for managed pond operation.

WA/SED-4: Impact to priority pollutant loads	Implementation of the proposed project could result in an increase in priority pollutants in the waters of Napa River or Fagan Slough.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Priority pollutants include metals, VOCs, SVOCs, PAHs, PCBs, and pesticides, dioxins, and furans. The Basin Plan establishes allowable levels of these constituents in the Napa River and Fagan Slough. Causing or contributing to an excursion beyond the allowable levels is considered significant.

Site history and use indicate that the priority pollutants listed are not expected to occur on the proposed project site at significantly elevated concentrations as compared with background levels in areas that would be below MHHW.

WA/SED-5: Impact to mercury concentrations	Implementation of the proposed project could result in increases in the amount of mercury in the water in the Napa Plant site ponds.
Significance:	Potentially significant
Mitigation WA/SED-5:	Monitor mercury concentrations pre-implementation and annually for five years post-implementation of the proposed project to determine if the restoration of tidal exchange leads to an increase in mercury concentrations in the ponds.
Residual Significance:	Less than significant

Impact Analysis Discussion: There would be two potential sources of mercury in the tidal and managed pond areas after implementation of the proposed project. Incoming tidal water from the Napa River would have a baseline mercury concentration. In addition, exposure of formerly upland sediments containing mercury to the anoxic conditions associated with the constant wetting and drying of tidal action, could potentially result in release of mercury from those sediments into the water column as methyl mercury. Vegetation cycling will also contribute to changes in methyl mercury (once vegetation is established).

WA/SED-PP-6: Impact to methyl mercury dynamics	Implementation of the proposed project could result in accumulation of methyl mercury in the sediment of the pond bottoms.
Significance:	Potentially significant
Mitigation WA/SED-PP-6:	Monitor mercury concentrations prior to and annually for five years after implementation of the proposed project to determine if the restoration of tidal exchange leads to increased sediment methyl mercury concentrations.
Residual Significance:	Less than significant

Impact Analysis Discussion: Accumulation of methyl mercury in the sediment of the pond bottoms could lead to adverse impacts on resident wildlife and, if the sediments are flushed from the ponds, on wildlife in adjacent waters. Sediment sampling data collected for the NSMRP in 2001 indicated that total mercury concentrations were higher in the sediments of the Napa River and nearby sloughs than in the sediments of the salt concentrator ponds.

Repeated cycles of wetting and drying of sediment, which are expected after tidal exchange is restored, are known to favor the production of methyl mercury. In the methylated form, mercury is highly toxic and strongly bioaccumulative. Even when methyl mercury concentrations in seawater are not high, the compound concentrates as it ascends the food chain, and may reach concentrations in fish which are high enough to cause methyl mercury poisoning. In the inorganic or divalent cation form, mercury is significantly less toxic.

In sediments where the redox potential is very low (significantly below -200 mV) mercury is bound up by H_2S and is unavailable to the sulfate reducing bacteria primarily responsible for the production of methyl mercury in estuarine environments. In sediments where redox potential is

high, the action of methylating organisms ceases and demethylation occurs. But between the two extremes of sediment redox potential, at moderately low redox potentials of around -200 mV, sulfate-reducing bacteria will produce significant amounts of methyl mercury.

Sediment samples were collected in October 2001 at the NSMRP site. The analytical results indicated that total mercury concentrations in the sediments of the Napa River and Napa Slough, adjacent to the NSMRP site, were 370 and 340 µg/kg dry weight, respectively. The mercury levels in the concentrator ponds were lower than in the Napa River or Napa Slough, and are shown in Table 4.7-4 below. The pattern of occurrence of total mercury in the sediments of the NSMRP site, displayed in Table 4.7-4, appears to be one of decreasing mercury concentrations in the sediment as the pond number increases. San Pablo Bay water was routed through the ponds in order of increasing pond number. It appears that mercury concentrations are highest in the sediment of the surrounding water bodies, and progressively lower in ponds further removed from the surrounding water bodies. This pattern suggests that the sediments at the Napa Plant site could have mercury concentrations similar to the levels measured in the higher numbered ponds at the NSMRP site, i.e., in the range of 50 to 100 µg/kg dry weight. It is not known whether total mercury in the sediments of the proposed project site ponds will increase after tidal exchange is reestablished.

Mercury methylation is a potentially significant impact. However, the potential for mercury methylation within the Napa Plant Site ponds will be dependent on sediment redox reactions, mercury concentration in incoming sediments that will be deposited in the ponds and other factors. The redox potential of the sediments in the Napa Plant Site ponds is not known, and will change after tidal action is introduced.

If mercury levels in the sediments in the proposed project site were to rise, then the potential for the formation of methyl mercury may increase. It is assumed (based on the NSMRP data) that the proposed project site pond sediments are presently lower in total mercury than the Napa River.

Table 4.7-4
Total Mercury Concentrations in Sediments of Nearby Salt Concentrator Ponds and Receiving Waters [µg/kg dry weight]

Site	Mercury concentration (µg/kg)	Site	Mercury Concentration (µg/kg)
Napa River	370	Pond 5	110
Napa Slough	340	Pond 6	60
Pond 1	340	Pond 6A	170
Pond 1A	180	Pond 7	30
Pond 2	120	Pond 7A	70
Pond 2A	290	Pond 8	70
Pond 3	260	1992 Criterion for Reuse * 2000 Draft Criterion for reuse	350 430
Pond 4	60	Alviso Ponds in the South Bay	500±

Notes:

*The criterion for reuse cited here is for sediment to be used for levee construction or cover material in wetlands, published in San Francisco Bay RWQCB (1992).

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Impacts and mitigation for Alternative 1 are equivalent to the proposed project for impacts WA/SED-1, WA/SED-4, WA/SED- 5, and WA/SED- 6. The impacts for WA/SED-2 and WA/SED-3 would be "less than significant" because there would be no managed pond under Alternative 1. Therefore, the potential for high salinity discharge and negative impacts on general water quality parameters is less for Alternative 1. No mitigation is required for WA/SED-2 or WA/SED-3.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Impacts under Alternative 2 are essentially equivalent to the proposed project because construction and operation activities would be nearly identical. The primary difference is that playa habitat would be established within the wash ponds. In the playa ponds, as the water evaporates in the late summer, salinity and temperature may increase, and dissolved oxygen may decrease. These parameters could trend outside Basin Plan standards. Since discharge to the Napa River from the playa ponds is not anticipated, little potential would exist for negative impacts to the Napa River. The playa ponds would constitute a small portion of the proposed project, and could provide for additional diversity in the wildlife supported in the lower Napa River region

ALTERNATIVE 3 – NO PROJECT

The No Project Alternative has the potential to create water quality conditions that cause excursions beyond Basin Plan water quality goals for several general water quality parameters. Under the No Project Alterative the ponds and crystallizer beds in the proposed project area would collect rainwater during the wet season, and dry out during the dry season. The water quality in the ponds would vary seasonally from slightly brackish conditions in the late winter (when the ponds would be full) to highly saline, low dissolved oxygen, high temperature, and possibly high pH in the late summer.

Water quality in the adjacent waters of the Napa River and Fagan Slough would not be affected unless an uncontrolled levee breach occurred. The probability of an uncontrolled levee breach would be highest during a high river flow event in the wet season, and this probability would increase as time progresses unless significant resources were devoted to levee maintenance. An uncontrolled levee breach could lead to excursions beyond Basin Plan water quality goals for several general water quality parameters. Causing or contributing to an excursion beyond the allowable levels in the Basin Plan is considered significant. Water in the ponds at the proposed project site would trend outside Basin Plan water quality objectives on a seasonal basis, with the poorest water quality occurring in summer. The ponds are likely to be dry between summer and the start of the rainy season.

4.8 AGRICULTURAL RESOURCES, LAND USE, AND PLANNING

This section describes the existing land uses at the proposed project site and in the surrounding areas, and evaluates the potential effects of the change in land use at the proposed project site on the surrounding lands in terms of effects on agricultural resources and conflict with plans and policies.

4.8.1 Regional Setting

The proposed project is located in the North Bay region of the San Francisco Bay Area. The North Bay region is made up of parts of Solano, Napa, Sonoma, and Marin counties, and includes the cities of American Canyon, Napa, Novato, San Rafael, and Vallejo. The North Bay region consists predominantly of two land uses: extensive and intensive agriculture and rural land (60 percent), and wildlife and open space areas (23 percent). Remaining land uses in the area—residential, commercial and light industry, public facilities, and heavy industry—each constitute less than 10 percent of the North Bay region. Land use trends include the following (BCDC 2003):

- Transition of rangeland and pastureland in southern Napa and Sonoma counties to vineyards
- Development of urban uses along the Highway 101 and SR 29 corridors
- Acquisition of large rural areas by federal and state wildlife agencies for wildlife habitat

4.8.1.1 Project Site

The 1,460-acre proposed project site is located in unincorporated Napa County adjacent to the Napa River and consists of a series of salt ponds, levees, water conveyance channels, and some upland areas. The site is designated "Agricultural, Watershed, and Open Space" in the Napa County General Plan and is zoned "Agricultural Watershed," with an additional zoning overlay of "Airport Compatibility District." These designations emphasize the protection of agriculture, watersheds, and floodplain from development, fire, pollution, and erosion. Uses of this land should be detrimental to or detrimentally affected by the use of a nearby airport. The past use of the site as a salt pond evaporation facility was consistent with these land use designations. The property was acquired by the State of California in 2003 and salt production is being phased out.

There are no Williamson Act contracts on the site and the site is not designated Important Farmland[1] under the California Resource Agency's Farmland Mapping and Monitoring Program (FMMP) (Napa County 2002; Department of Conservation 2002; Aubrey, pers. comm., 2005).

4.8.1.2 Existing Land Uses and Land Use Designations in the Project Vicinity

Most of the lands adjacent to the proposed project site are located in unincorporated Napa County, although some of the lands to the south of the proposed project site are within the jurisdiction of the City of American Canyon. The existing land uses in the vicinity of the proposed project are generally consistent with or are less intensive than the land use designations

[1] Important Farmland is defined under CEQA to consist of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.

and zoning of Napa County and the City of American Canyon. The land use designations to the east of the site include "Public Airport," "Industrial," and "Rural Residential." Some of the areas that are designated industrial currently exist as agricultural land, vacant undeveloped land, or are under residential land uses. With their given designations, these land uses could change to more industrial uses. The County land use designation to the north, west, and south of the site is "Agricultural, Watershed, and Open Space." All of the existing land uses to the north, south, and west of the site are consistent with these designations.

Lands that surround Napa County Airport have an additional zoning designation of "Airport Compatibility Overlay District." This overlay allows for land uses that would accommodate growth and development of the public-use airport and prohibits certain land uses (such as residential, schools, hospitals) or conditionally approves some uses (such as retail buildings and offices, hotels) (Napa County 2002; Napa County 1996).

The American Canyon General Plan designates some of the lands to the south of the site as "Public." These lands are utilized for existing public facilities operated by the City of American Canyon (Envicom Corporation 2004).

4.8.1.3 Existing Natural Areas in the Project Vicinity

Wetlands, largely owned by the State of California, are located on three sides of the proposed project area. The NSMWA is comprised of many units totaling approximately 16,000-17,000 acres of tidal and seasonal wetlands and managed ponds. These wetlands, owned by DFG, include units located from the east bank of the Napa River to the west bank of Tolay and Sonoma Creeks and from San Pablo Bay north to Bull Island and Wingo. The units closest to the proposed project area are Fagan Marsh Ecological Reserve, which is contiguous with the northern edge of Ponds 9 and 10, the American Canyon unit to the south, and the Napa River and Huichica Creek units located across the Napa River to the west.

4.8.1.4 Agricultural Lands in the Project Vicinity

A few parcels of lands to the east and southeast of the site are designated as Prime Farmland, Farmland of Statewide Importance, or land of local importance pursuant to the FMMP. The land operated by Green Island Vineyard, located adjacent to Ponds B-2 and B-3, is classified as Prime Farmland or Farmland of Statewide Importance and is currently in agricultural production (vineyards). A large tract of land to the east of Green Island Road and south of Napa County Airport is designated as farmland of local importance. Most of this land is currently vacant and covered by herbaceous vegetation. The land to the east of Pond B-3 is designated farmland of local importance. This land currently exists as wetlands or a public sanitation facility. There are no Williamson Act contracts in the area surrounding the proposed project site. The closest Williamson Act contract land is northwest of the site, on the west side of the Napa River (Department of Conservation 2002; Aubrey, pers. comm., 2005).

4.8.1.5 Applicable Plans and Policies

The proposed project site was acquired by the DFG from Cargill Salt Company in 2003 as part of the larger State of California purchase of salt ponds in the San Francisco Bay estuary. Because the proposed project site is a state-owned property, there is no local jurisdiction over the

proposed project. However, the DFG is interested in coordinating the proposed project with the beneficial planning efforts of Napa County and the City of American Canyon. Therefore, policies applicable to the vicinity of the proposed project that are included in the County and City General Plans are also discussed below. The plan that is most directly pertinent to the proposed project is the BCDC's San Francisco Bay Plan.[2]

The San Francisco Bay Plan

The BCDC was created by the McAteer-Petris Act of the California Legislature in 1965 "to prepare an enforceable plan to guide the future protection and use of San Francisco Bay and its shoreline." The outcome of that legislation, the San Francisco Bay Plan, adopted by the BCDC in 1969, enables the BCDC to regulate development of certain kinds of land uses adjacent to the Bay. The purpose of the plan is to protect the Bay, its sloughs, estuaries, salt ponds, tidal marshes, managed wetlands, and other natural resources, and to develop the Bay and the shoreline to the highest potential with the minimum of fill. Besides regulating bay fill, the Bay Plan promotes the development of maritime ports, economically important channel deepening, essential airport expansion, and maintenance of wildlife areas.

The BCDC has jurisdiction over all tidal areas of San Francisco Bay and reviews and issues separate permits for filling or dredging, and for shoreline development. Shoreline development is regulated by the BCDC through its jurisdiction over its 100-foot-wide "Shoreline Band" along the edge of the entire San Francisco Bay and related waters. The "Shoreline Band" extends 100 feet inland from the line of highest tidal action.

The Bay Plan Findings and Policies are made up of two sections, one related to the Bay as a natural resource, and one to development of the Bay and its shoreline. The policies are focused on preservation of the natural resources of the Bay such as fish and wildlife habitat, water quality, marshes, mudflats, and similar resources while accommodating reasonable development needs.

The Bay Plan also contains an implementation section showing how policies apply to specific portions of the Bay. This section consists of a series of maps for each part of the Bay, reflecting the policies and suggestions of the BCDC and identifying existing and proposed shoreline features and major land uses. Plan Map 2 in the Bay Plan identifies the proposed project site as salt pond/managed wetlands, and notes that the site could be used as a shallow-draft port and for a regional dredged material rehandling facility (BCDC 2001). Bay Plan policies relevant to the proposed project are summarized in Table 4.8-1.

Table 4.8-1
San Francisco Bay Plan Policies Relevant to the Project and Project Alternatives

Policy	Consistency
Fish, Other Aquatic Organisms & Wildlife	
1. To assure the benefits of fish, other aquatic organisms, and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored, and increased.	The purpose of the proposed project is to restore and increase tidal marsh habitat in the Bay Area.
2 Specific habitats that are needed to conserve, increase, or prevent the extinction of any native species, threatened or endangered species, species that the California Endangered Species Act protects, or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes.	The proposed project would create tidal habitats, which would potentially benefit special-status species such as the black rail, California clapper rail, San Pablo song sparrow, and salt marsh harvest mouse.
Water Quality	
1. Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water-surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Freshwater inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.	The proposed project would assist in improving water quality in the Bay by restoring and enhancing tidal marsh and tidal flats at the proposed project site.
Water Surface Area and Volume	
2. Water circulation in the Bay should be maintained, and improved as much as possible. Any proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects upon water circulation or at least to minimize any harmful effects.	The proposed project would breach existing levees along the Napa River and excavate or dredge tidal channels in the existing ponds to facilitate tidal action within the proposed project site. Tidal channels are proposed along the alignments of historic tidal sloughs. In essence, the proposed project will attempt to restore the hydrology of the site to pre-development conditions
Tidal Marshes and Tidal Flats	
4. Where and whenever possible, former tidal marshes and tidal flats that have been diked from the Bay should be restored to tidal action to replace lost historic wetlands or should be managed to provide important Bay habitat functions, such as resting, foraging, and breeding habitat for fish, other aquatic organisms, and wildlife. As recommended in the Baylands Ecosystem Habitat Goals report, around 65,000 acres of areas diked from the Bay should be restored to tidal action. Further, local government land use and tax policies should not lead to the conversion of these restorable lands to uses that would preclude or deter potential restoration. The public should make every effort to acquire these lands from willing sellers for the purpose of restoration.	The proposed project is an outcome of the recommendations of the Baylands Ecosystems Habitat Goals report and proposes to restore tidal action to former tidal marsh areas that were diked from the Bay.

Table 4.8-1 (continued)
San Francisco Bay Plan Policies Relevant to the Project and Project Alternatives

Policy	Consistency
5. Any tidal restoration project should include clear and specific long- and short-term biological and physical goals, and success criteria and a monitoring program to assess the project's sustainability. Design and evaluation of the project should include an analysis of (a) the effects of relative sea-level rise; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread, and their control; (f) rates of colonization by vegetation; (g) the expected use of the site by fish, other aquatic organisms, and wildlife; and (h) site characterization. If success criteria are not met, appropriate corrective measures should be taken.	The proposed NPSR project has clearly defined goals and objectives that encompass all of the major components of the proposed project including biology, hydrology, public access, public health and operations and maintenance. The proposed project has utilized hydrodynamic modeling and geomorphic analysis to develop and evaluate the ecological and hydrologic objectives of the proposed project. The NPSR team has worked with resource agencies and Science Review Team in development of the proposed project and alternatives. Representatives from USGS, BCDC, RWQCB, San Francisco Estuary Institute, and Wetlands and Water Resources attended these meetings. The NPSR team will continue to work with the resource agencies to refine the proposed project and develop a monitoring and adaptive management plan.
6. Nonnative species should not be used in habitat restoration projects. Any habitat restoration project approved by the Commission should include a program for the periodic monitoring of the site for nonnative species and a program for control and, if appropriate and feasible, eradication should an introduction occur. The use of nonnative plant species in public access landscape improvements should be avoided where a potential exists for nonnative plants to spread into the Bay, other waterways, or transition zones between tidal and upland habitats.	Non-native species would not be used as part of the proposed project. Monitoring for invasive species will be a component of the proposed project monitoring and adaptive management plan.
8. Based on scientific ecological analysis and consultation with the relevant federal and state resource agencies, a minor amount of fill may be authorized to enhance or restore fish, other aquatic organisms, or restoration except where filling is feasible.	The proposed project would involve placement of some amount of fill in the ponds for a number of reasons: to create ecotones, to raise pond bottom elevations to accelerate the establishment of marsh vegetation, and to create habitat islands in the managed pond. Fill would also be necessary to improve some of the existing levees. Fill would be obtained from within the site and potentially from Napa River dredged material. The placement of fill for the proposed project would not conflict with the Bay Plan because of the reasons for which fill is proposed.
Subtidal Areas	
2. Subtidal areas that are scarce in the Bay or have an abundance and diversity of fish, other aquatic organisms, and wildlife (e.g., eelgrass beds, sandy deepwater or underwater pinnacles) should be conserved. Filling, changes in use, and dredging projects in these areas should therefore be allowed only if (a) no feasible alternative exist, and (b) the project provides substantial public benefits.	The proposed project would not fill any subtidal areas.
3. Subtidal restoration projects should be designed to (a) promote an abundance and adversity of fish, other aquatic organisms, and wildlife; (b) restore rare subtidal areas; (c) establish linkages between deep and shallow water and tidal and subtidal habitat in an effort to maximize habitat values for fish, other aquatic organisms, and wildlife; or (d) expand open-water areas in an effort to make the Bay larger.	Some of the construction for the proposed project may occur in subtidal habitat. The tidal channels that would be excavated in the North and South Units would eventually connect the subtidal portions of the Napa River and Fagan Slough with intertidal habitats in the proposed project area. Additional subtidal habitat may develop in the area as a result of the restoration of the tidal areas. These habitats would potentially benefit fish and other aquatic organisms such as steelhead, Sacramento splittail and Delta smelt.

Table 4.8-1 (continued)
San Francisco Bay Plan Policies Relevant to the Project and Project Alternatives

Policy	Consistency
4. Any subtidal restoration project should include clear and specific long- and short-term biological and physical goals, and success criteria and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of (a) the scientific need for the project; (b) the effects of relative sea-level rise; (c) the impact of the project on the Bay's sediment budget; (d) localized sediment erosion and accretion; (e) the role of tidal flows; (f) potential invasive species introduction, spread, and their control; (g) rates of colonization by vegetation, where applicable; (h) the expected use of the site by fish, other aquatic organisms, and wildlife; and (i) characterization of and changes to local bathymetric features. If success criteria are not met, corrective measures should be taken.	See "Tidal Marshes and Tidal Flats", item 5 and Appendices A and B.
Dredging	
2. Dredging should be authorized when the BCDC can find (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose, such as navigational safety; (b) the materials to be dredged meet the water quality requirements of the San Francisco Bay RWQCB; (c) important fisheries and Bay natural resources would be protected through seasonal restrictions established by the DFG, USFWS, and/or NMFS, or through other appropriate measures; (d) the sitting and design of the project would result in the minimum dredging volume necessary for the project; and (e) the materials would be disposed of in accordance with Policy 3.	The proposed project may include a small amount of dredging to create levee breaches for restoration of tidal action and to construct channels.
3. Dredging materials should, if feasible, be reused or disposed outside the Bay and certain waterways. Except when reused in an approved fill project, dredged material should not be disposed in the Bay and certain waterways unless disposal outside these areas is infeasible and the BCDC finds (a) the volume to be disposed is consistent with the applicable dredger disposal allocations and disposal site limits adopted by the BCDC by regulation; (b) disposal would be at a site designated by the BCDC; (c) the quality of the material disposed of is consistent with the advice of the San Francisco Bay RWQCB and the interagency Dredged Material Management Office; and (d) the period of disposal is consistent with the advise of the DFG, the USFWS, and NMFS.	The NPSR project team is working with the Napa County Flood Control and Water Conservation District (Napa Flood District) to explore the possibility of using the North Unit as a one-time dredge material disposal site for the Napa River maintenance dredging project. Napa Flood Control would need to obtain the permits necessary to use the ponds as a dredged material disposal site.

Table 4.8-1 (continued)
San Francisco Bay Plan Policies Relevant to the Project and Project Alternatives

Policy	Consistency
11. a. A project that uses dredged material to create, restore, or enhance Bay or certain waterway natural resources should be approved only if: (1) The BCDC, based on detailed site-specific studies, appropriate to the size and potential impacts of the project, that include, but are not limited to, site morphology and physical conditions, biological considerations, potential for fostering invasive species, dredged material stability, and engineering aspects of the project, determines all of the following: (a) The project would provide, in relationship to the project size, substantial net improvements in habitat for Bay species. (b) No feasible alternatives to the fill exist to achieve the project purpose with fewer adverse impacts to Bay resources. (c) The amount of dredged material to be used would be the minimum amount necessary to achieve the project's purpose. (d) Beneficial uses and water quality of the Bay would be protected. (e) A high probability exists that the project would be successful and not result in unmitigated environmental harm.	The proposed project would use dredged material, if available, to fill portions of the North Unit (Pond 10) or other areas prior to restoration of tidal action. Reuse of dredged material has the potential to expedite the restoration of tidal marsh habitat. Much of the proposed project area has subsided from the historic condition. Raising the elevation of the salt ponds in the proposed project area would accelerate the restoration process, and result in creation of tidal marsh habitats in a shorter time than would occur if no dredged material was used. Expediting development of tidal marsh would benefit many species-status species and could mitigate potential impacts that intertidal mudflat habitat may have on adjacent land use (i.e., Napa County Airport).
(2) The project includes an adequate monitoring and management plan and has been carefully planned, and the BCDC has established measurable performance objectives and controls that would help ensure the success and permanence of the project, and an agency or organization with fish and wildlife management expertise has expressed to the BCDC its intention to manage and operate the site for habitat enhancement or restoration purposes for the project's life. (3) The project would use only clean material suitable for aquatic disposal and the BCDC has solicited the advise of the San Francisco Bay RWQCB, the Dredged Material Management Office, and other appropriate agencies on the suitable of the dredged material.	(2) See "Tidal Marshes and Tidal Flats", item 5. (3) Dredged material would be tested for suitability for wetland creation prior to reuse.
Recreation	
2. The BCDC should also allow additional marinas, boat-launching lanes, and fishing piers elsewhere on the Bay, provided they would not preempt land or water area needed for other priority uses and provided they would be feasible from an engineering viewpoint, would not have significant adverse effects on water quality and circulation, would not result in inadequate flushing, would not destroy valuable tidal marshes or tidal flats, and would not harm identified valuable fish and wildlife resources.	The proposed project includes development of some limited parking, picnicking areas, restrooms, a boat-launching facility at the barge channel, trails for use by pedestrians and bicyclists, and interpretive signage, and possibly an environmental interpretive center in the future. None of these facilities would adversely affect water quality, destroy valuable marshlands, or harm wildlife.

Table 4.8-1 (continued)
San Francisco Bay Plan Policies Relevant to the Project and Project Alternatives

Policy	Consistency
4. d. **Launching Lanes.** (1) Launching lanes should be placed where wind and water conditions would be most favorable for smaller boats. (2) Some launching lanes should be located near prime fishing areas and others near calm, clear water suitable for waterskiing. (3) Additional launching facilities should be located around the Bay shoreline, especially where few facilities exists. These facilities should be available free or at moderate cost. Launching facilities should include adequate car and trailer parking, restrooms, and public access. (4) In marinas, launching facilities should be encouraged where adequate upland provides needed support facilities. (5) Fill for ramps into the water, docks, and similar facilities should be permitted. Other fill should not be permitted.	The proposed project would open existing floating docks and a launch ramp to the public. These facilities are located on the barge channel, approximately 1,800 feet from the Napa River.
Public Access	
1. A proposed fill project should increase public access to the Bay to the maximum extent feasible, in accordance with the policies for Public Access to the Bay.	The proposed project would increase public access by establishing trails and other recreational facilities at the proposed project site.
2. In addition to the public access to the Bay provided by waterfront parks, beaches, marinas, and fishing piers, maximum feasible access to and along the waterfront and on any permitted fills should be provided in and through every new development in the Bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, wildlife area, or other use, except in cases where public access would be clearly inconsistent with the project because of public safety considerations or significant use conflicts, including unavoidable, significant adverse effects on Bay natural resources. In these cases, in-lieu access at another location preferably near the project should be provided.	The proposed project would improve public access to the majority of the site compared to existing conditions. However, to protect the resources in the North Unit, that portion of the site would be incorporated into the Fagan Marsh Ecological Reserve, where limited human access is allowed. This is consistent with the Bay Plan policy, which discourages public access in areas with sensitive natural resources.
3. Public access to some natural areas should be provided to permit study and enjoyment of these areas. However, some wildlife are sensitive to human intrusion. For this reason, projects in such areas should be carefully evaluated in consultation with appropriate agencies to determine the appropriate location and type of access to be provided.	See above.
4. Public access should be sited, designed, and managed to prevent significant adverse effects on wildlife. To the extent necessary to understand the potential effects of public access on wildlife, information on the species and habitats of a proposed project site should be provided, and the likely human use of the access area analyzed.	See above.

Table 4.8-1 (continued)
San Francisco Bay Plan Policies Relevant to the Project and Project Alternatives

Policy	Consistency
Salt Ponds and Other Managed Wetlands	
1. As long as is economically feasible, the salt ponds should be maintained in salt production and the wetlands should be maintained in their present use. Property tax policy should assure that rising property taxes do not force conversion of the ponds and other wetlands to urban development. In addition, the integrity of the salt production system should be respected (i.e., public agencies should not take for other projects any pond or portion of a pond that is a vital part of the production system).	The salt ponds at the site are in a phase-out salt production mode. Their use was discontinued based on a full evaluation of the economics of salt production in the Bay Area by the site's previous owners.
2. If, despite these provisions, the owner of the salt ponds or the owner of any managed wetland desires to withdraw any of the ponds or marshes from their present uses, the public should make every effort to buy these lands, breach the existing dikes, and reopen these areas to the Bay. This type of purchase should have a high priority for any public funds available, because opening ponds and managed wetlands to the Bay represents man's last substantial opportunity to enlarge the Bay rather than shrink it. (In some cases, if salt ponds are opened to the Bay, new dikes would have to be built on the landward side of the ponds to provide the flood control protection now being provided by the salt pond dikes.)	The proposed project is consistent with this policy of the Bay Plan with respect to salt ponds.
Plan Map 2 Policies	
3. **Regional Restoration Goal for San Pablo Bay** - Restore large areas of tidal marsh and enhance seasonal wetlands. Some of the inactive salt ponds should be managed to maximize their habitat functions for shorebirds and waterfowl, and others should be restored to tidal marsh. Shallow subtidal areas (including eelgrass beds) should be conserved or restored.	The proposed project meets the restoration goals for San Pablo Bay.

Napa County General Plan

The Napa County General Plan is a program for the protection and development of unincorporated areas of Napa County. As the General Plan notes, its purpose is to preserve agriculture and concentrate urban uses in existing urban areas. The County General Plan contains Policies 3.1 through 3.15 for the protection and enhancement of agriculture in the County.

The General Plan does not contain policies specifically related to Napa County Airport, although the General Plan lists the Napa County Airport Land Use Plan among the programs and actions that may have an impact on the General Plan. Consultation with the County Planning Office for this EIR revealed that the Napa County Airport Land Use Plan is currently being revised and at this time the County relies on its zoning ordinance to guide development in areas that surround the airport. The County utilizes an overlay district to regulate development surrounding the airport. Chapter 18.80 of the County Zoning Ordinance stipulates which uses are prohibited and which uses are considered not normally acceptable in each of the Airport Land Use Compatibility Plan (ALUCP) zones of the Napa County Airport.

ALUCP zones are safety compatibility zones that reflect the geographic pattern of aircraft accident risks. The sizes and shapes of the compatibility zones for general aviation airports include adjustments for runway length, instrument approach visibility, and the airport's activity level. Figure 4-6 shows safety compatibility zones for the Napa County Airport based on the FAA-approved airport layout plan. Table 4.8-2 summarizes the risks associated with each zone, and the basic compatibility qualities.

As Figure 4-6 shows, the proposed project site is located within all five ALUCP zones of Napa County Airport, with the majority of the site within ALUCP Zones C and D.

City of American Canyon General Plan

Although the proposed project site is not located within City of American Canyon city limits, it is within the City's planning area and adjacent to the northwestern portion of the proposed City Urban Limit Line. The northwestern portion of the City and the lands outside the city limit in this area but within the City Urban Limit Line are designated industrial in the City's General Plan. The General Plan contains policies to accommodate and promote industrial land uses in the areas designated for industrial uses. In addition, a pocket of land adjacent to Pond B-3 is within the City Urban Limit Line. This pocket is identified as Subarea T (Eucalyptus Grove Recreation Area) in the City General Plan and is earmarked for commercial recreation.

Table 4.8-2
Airport Safety Compatibility Zones

Zone*	Risk Factors	Compatibility Qualities	Proposed Project
A. Runway Protection Zone	Very high risk; runway protection zone as defined by FAA criteria.	Prohibit all new structures, residential land uses, and noise sensitive uses; Uses not normally acceptable include those uses that create hazard to flight.	A small portion of the proposed project site (a portion of Pond 10) is within Zone A.
B. Approach/ Departure Zone	Substantial accident risk, high noise levels, low overflights below 100 feet.	Prohibit residential use, children's schools, daycare centers, hospitals, nursing homes; limit nonresidential use to activities attracting few people. Uses not normally acceptable include those uses that have a propensity to attract birds.	A small portion of the proposed project site (portions of Ponds W2, 9, 10, and B-1) is within Zone B.
C. Extended Approach/ Departure Zone	Approaching aircraft usually at less than traffic pattern altitude. Moderate accident risk; substantial noise; low overflights below 300 feet	Prohibit residential use except for residential uses allowable under agricultural land use and zoning; children's schools, daycare centers, hospitals, nursing homes. Uses not normally acceptable include those uses that have a propensity to attract birds.	Large portions of the site (Unit 3, Ponds B-2, B-3, W1, and W2) are in Zone C.
D. Sideline Zone	Area not normally overflown; primary risk is with aircraft losing directional control on takeoff.	Prohibit landfills and residential uses except for residential uses allowable under agricultural land use and zoning. Uses not normally acceptable include those uses that have a propensity to attract birds.	Large portions of the site (Ponds B-3, CB1 through CB9, B-1, 9, and 10) are in Zone D.
E. Traffic Pattern Zone	Low likelihood of accident occurrence; risk concern is primarily with uses for which potential consequences are severe.	Allow residential uses and most nonresidential uses.	Very small portion of the site is in Zone E.

*Safety compatibility zones are illustrated on Figure 4-6.

Source: Napa County Zoning Ordinance.

4.8.2 Impacts and Mitigation Measures

4.8.2.1 Standards of Significance

The following standards of significance are based on CEQA Guidelines, Appendix G. For the purposes of this EIR, implementation of the proposed project would have a significant impact on agricultural resources or land use if it would:

- Involve other changes in the existing environment, which due to their location or nature, could result in conversion or otherwise affect farmland considered Prime, Unique, or of Statewide Importance to nonagricultural use.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project adopted for the purpose of avoiding or mitigating an environmental effect.

Implementation of the proposed project would not result in an impact related to conflict with a Williamson Act contract because no lands under a Williamson Contract are present on or near the proposed project site. The proposed project would also not physically divide an established community, as none is present at the proposed project site. The proposed project would not conflict with any applicable HCP or NCPP because no HCP or NCPP is applicable to the proposed project site or vicinity at this time. Therefore, these significance criteria are not used in this analysis.

4.8.2.2 Analytical Method

To evaluate direct and indirect impacts on agricultural resources, the FMMP map for the proposed project area was examined for the presence of Important Farmland, which as noted earlier in this section includes Prime, Unique, or Farmland of Statewide Importance.

To evaluate land use impacts, applicable regional and local land use plans and ordinances were reviewed. Existing land uses were identified based on aerial photos of the proposed project area, and land use designations were obtained from the Napa County General Plan and the City of American Canyon General Plan.

4.8.2.3 Impacts and Mitigation Measures

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

LU-1: Conversion of Important Farmland	The proposed project would not directly or indirectly convert any lands on or adjacent to the site identified as Important Farmland under the FMMP to nonagricultural uses. However, the proposed project could indirectly affect adjacent agricultural lands.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Based on the Important Farmland map produced by the California Department of Conservation, Division of Land Resource Protection under the FMMP, no part of the proposed project site is designated as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland.

Indirect impacts on nearby agricultural lands can result from the location of incompatible uses adjacent to existing agricultural uses. Conflicts between two incompatible uses can, in extreme cases, result in the abandonment of agriculture in the zone of conflict. As noted earlier, a few parcels of land lie to the east and south of the proposed project site that are designated as Prime Farmland, Farmland of Statewide Importance, or Farmland of Local Importance. However, only one parcel east of Pond B-3 qualifies as Important Farmland and is in active agricultural use.

The proposed project site has been used for salt production since at least the early 1960's. The proposed project would restore this area to tidal marsh and a managed pond where human activity would be limited to passive recreation, recreational fishing, and hunting. These activities would not affect the agricultural activities in the vicinity of the proposed project.

Indirect impacts to ongoing agricultural activities on this parcel may include salt spray and dispersal of foam formed on the salt pond surface. Currently, salt spray and foam pose a risk to grapes grown at the vineyard east of Pond B-2. The proposed project reduces the risk of crop damage from salt spray and foam dispersal because of the decreased salinity and duration of inundation in the ponds. Groundwater contamination from saltwater intrusion may impact agricultural areas adjacent to the salt ponds. Cargill recently "keyed" (i.e., placed of a clay core in the center of the levee) the salt pond levee to reduce seepage to the adjacent Green Island Vineyard (Ransom and Paredes, pers. comm., 2005). The risk of saltwater intrusion to groundwater would be reduced with the proposed project because of the decreased salinity and duration of inundation in the ponds.

The impact is considered less than significant.

LU-2: Conflicts with land use plans, policy or regulations	Implementation of the proposed project would conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project that was adopted for the purpose of avoiding or mitigating an environmental effect.
Significance:	Significant
Mitigation:	No mitigation other than PHS-1a and 1b
Residual Significance:	Significant and unavoidable

Impact Analysis Discussion: As noted earlier, the proposed project site was acquired by the DFG in 2003 as part of the larger State of California purchase of salt ponds in the San Francisco Bay estuary. Because the site is a state-owned property, there is no local jurisdiction over the proposed project. However, the DFG has reviewed the County and City of American Canyon land use plans and policies because it wishes to coordinate the proposed project with the planning efforts of the County and the City. Consistency with these plans and BCDC's Bay Plan is discussed below.

Consistency with the Bay Plan

The proposed project site is located within the BCDC's area of jurisdiction, which includes not only the San Francisco Bay and the shoreline band but also salt ponds, managed wetlands, and certain waterways. Table 4.8-1 presents the proposed project's consistency with specific policies in the Bay Plan. The proposed project is consistent with the overall BCDC policies for the protection of natural resources, water quality, public access, recreation, placement of fill, dredging, and salt ponds, as well as the project-area specific policies contained in the implementation section of the Bay Plan. Therefore, no impact would stem from a conflict with the Bay Plan.

Consistency with the Napa County General Plan

The proposed project would not conflict with the Napa County General Plan policies for the protection of agricultural resources. The project as proposed, however, would not be compatible with the Napa County Zoning Ordinance as it relates to the Airport Compatibility Overlay District. As stated in Table 4.8-2, according to the County Zoning Ordinance, uses that attract birds, such as new ponds, are among uses not normally acceptable in ALUCP Zones B, C, and D. The proposed project does not propose new ponds but does include changes to existing ponds that could increase wildlife activity at the project site. It should be noted however, that there are seasonal wetlands on the airport property and tidal wetlands and freshwater ponds immediately west of the airport which all attract birds to the airport area. These wetlands have been present for decades and will continue to exist into the future.

The purpose of the proposed project is to create wildlife habitat and it is expected that with project implementation, the variety and number of wildlife at the site will increase. It is anticipated that introducing tidal action to the North, Central, and South units would result in the creation of vegetated tidal marsh over time. With the reduction in open-water areas and increase in marsh vegetation, shorebird and waterfowl use is likely to decrease and passerine (small song birds) use would increase (Stralberg et.al. 2003). Therefore over time, the North, Central and South units would support fewer waterfowl and shorebirds, which are the species that are most hazardous to aircraft at low altitudes in Napa County Airport's ALUCP Zones B and C. Detailed analysis and discussion of the bird strike hazard issue is presented in Section 4.11.1.3.

A portion of Pond 10 in the North Unit is within ALUCP Zone A and for that pond, the proposed project includes placement of fill to raise the pond bottom so that it transitions to tidal marsh on an accelerated schedule. In addition, the proposed project facilitates the safety planning objectives of the Napa County Airport by placing fill near the west end of runway 6/24. Sufficient fill would be placed to create approximately 9 acres of upland in the approximate alignment of a potential future runway safety zone planned by the airport. With respect to other areas of the proposed project site that are within ALUCP Zones B and C, the DFG would implement Mitigation Measures PHS-PP-1a and 1b to reduce waterfowl use and hasten vegetation establishment.

The proposed project includes development of a managed pond in the South Unit that would contain open water. This portion of the proposed project site would, therefore, continue to attract waterfowl and shorebirds, and it is considered likely that the number/density of birds in this area would increase as a result of the proposed project. This area lies within ALUCP Zone D where land uses that have the propensity to attract birds are considered normally not acceptable.

Therefore, this use could conflict with the Napa County Zoning Ordinance for airport compatibility.

Consistency with the City of American Canyon General Plan

The review of the City of American Canyon General Plan has indicated that the proposed project would not conflict with the implementation of the plan with regard to land use planning efforts that have been adopted for the purpose of avoiding or mitigating environmental effects.

In summary, with the incorporation of mitigation measures the conflict of the proposed project with applicable plans and policies would be reduced but would not be eliminated. Therefore, the impact would be significant and unavoidable.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Land use impacts and mitigation for Alternative 1 are generally equivalent to the proposed project. As discussed under Impact LU-2, areas of the proposed project site where tidal action is reintroduced will become vegetated over time and open-water area would be reduced. Studies of salt ponds in the Bay Area have shown that tidal marsh supports fewer shorebirds and waterfowl than salt ponds (Stralberg et.al. 2003). Under Alternative 1, the entire proposed project site would be restored to tidal action and would have no managed pond. Therefore under this alternative, the potential conflict with the County Zoning Ordinance as related to Airport Compatibility Overlay District would be reduced slightly compared to the proposed project. Some mitigation measures that are required for the proposed project would, however, still be required under this alternative to minimize the bird strike hazard to aviation.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Land use impacts and mitigation for Alternative 2 are generally equivalent to the proposed project. Under Alternative 2, the Central Unit would be playa that would not receive tidal water and would instead be dependent on direct precipitation. As a result, the area would have shallow, open water seasonally and would be dry for the remainder of the year. Marsh vegetation is unlikely to establish here due to the high salinities and seasonal drying. These conditions are likely to attract waterfowl and shorebirds during the winter and spring months. Therefore under this alternative, the potential conflict with the County Zoning Ordinance as related to Airport Compatibility Overlay District would be increased somewhat compared to the proposed project because instead of just one area of open water (i.e., the managed pond) under the proposed project, this alternative would have two large areas of open water, potentially attracting more birds. Also, the playa is closer to the runways than the managed pond and portions lie within ALUCP Zone B. All mitigation measures that are required for the proposed project would be required under this alternative to minimize the bird strike hazard to aviation.

ALTERNATIVE 3 – NO PROJECT

Under the No Project Alternative the perimeter levees would be maintained and the site would function as playa or seasonal ponds. This would not impact agricultural resources in any way. However, the ponds would provide suitable habitat for waterfowl and shorebirds in winter and spring. The ponds would be dry in the summer and fall and would be less attractive to birds. It is

unlikely that the ponds would become vegetated because of the long period of inundation and residual salinity in the soils. Therefore, nearly the entire site would seasonally be open water habitat in perpetuity. Under the No Project Alternative, the potential conflict with the County Zoning Ordinance as related to Airport Compatibility Overlay District may seasonally be greater than in the proposed project.

4.9 NOISE

This chapter describes noise conditions in the area of the proposed project. It includes the regulatory, regional, and proposed project settings to provide a context for analyzing the effects of the proposed project. Information about noise in Napa County was adapted from the Napa County General Plan. Additional information was taken from the City of American Canyon General Plan EIR (Envicom 1994). State and local agencies have developed guidelines for evaluating land use compatibility under different sound-level ranges; "Regulatory Setting" below summarizes those guidelines at both the state and county level. "Regional Setting" and "Project Setting" describe existing noise conditions at and adjacent to the proposed project site.

The following noise terminology is used in this chapter:

- *Noise*: Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- *Decibel* (*dB*): A unit-less measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- *A-Weighted Decibel* (*dBA*): An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- *Equivalent Sound Level* (L_{eq}): A logarithmic average of noise levels from all sources of noise in a given area over a stated period of time (e.g., 24 hours, 1 year).
- *Day-Night Equivalent Sound Level* (L_{dn}): A 24-hour average sound level with a 10-dB "penalty" added to noise during the hours between 10 pm and 7 am to account for the greater noise sensitivity of people at night.
- *Sensitive Receptor:* A population that is more susceptible to impacts than the general population. Sensitive noise receptors include schools, churches, childcare centers, health care facilities, and convalescent centers.

Typical noise levels found in Napa County are provided in Table 4.9-1.

Table 4.9-1
Typical dBA and Associated Noise Source for Napa County

dBA	Noise Source
100 dBA	Train Horn at 100 feet
80 dBA	Heavy Truck cruising on State Route 29 at distance of 60 feet
75 dBA	"Loud" Motorcycle crossing at 60 feet
70 dBA	Normal Voice at 2 feet
65 dBA	Calistoga tow plane at 1,500 feet
50 dBA	Typical ambient away from roadways during the day in south county
30 dBA	Typical ambient away from roadways during the day in north county
20-25 dBA	3 am in isolated area in county

4.9.1 Sources of Information

Significant portions of this section were developed from the following resources:

- Napa River Salt Marsh Restoration Project Final Environmental Impact Report (NSMRP) (CSCC and CDFG 2004)
- Napa County Airport Industrial Park Environmental Impact Report (Napa County 1996)
- Noise Element, Napa County General Plan (Napa County 1990)
- American Canyon General Plan, Final EIR (Envicom Corporation 1994)

4.9.2 Regulatory Setting

The Napa County General Plan provides a basis for comprehensive local programs to abate environmental noise and to protect citizens from excessive exposure to it. The compatible land use guidelines are divided into four compatibility levels: completely compatible, tentatively compatible, normally incompatible, and completely incompatible. Projects that exceed, or are expected to exceed, acceptable levels should utilize mitigation measures to reduce the noise.

4.9.2.1 Noise Compatibility Definitions:

- **Completely Compatible:** The noise exposure is such that both the indoor and outdoor environment is pleasant.
- **Tentatively Compatible:** The noise exposure is great enough to be of some concern, but common building construction practices will make the living indoor environment acceptable, even for sleeping quarters, and the outdoor environment will be reasonably pleasant for recreation and play.
- **Normally Incompatible:** The noise exposure is so severe than unusual and costly building construction is necessary to ensure some tranquility insides one's home, and barriers must be erected between the site and prominent noise sources to make the outdoor environment tolerable.
- **Completely Incompatible:** The noise exposure at the site is so severe that construction costs to make the indoor living environment acceptable would be prohibitive and the outdoor environment would still be intolerable.

Table 4.9-2 shows the noise levels associated with these compatibility classes.

The maximum interior intermittent noise level for residential single- and two-family dwellings is 60 dBA during the day and 55 dBA during the evening. Sleeping areas should have a maximum of 50 dBA.

Table 4.9-2
Compatibility Noise Levels

Land Use	Completely Compatible (dBA)	Tentatively Compatible (dBA)	Normally Incompatible (dBA)	Completely Incompatible (dBA)
Residential	Less than 55	55-60	60-75	Greater than 75
Commercial	Less than 65	65-75	75-80	Greater than 80
Industrial	Less than 70	70-80	80-85	Greater than 85

Sources: Environmental Protection Agency, San Francisco Department of City Planning, San Mateo County Airport Land Use Commission, Santa Clara County Airport Land Use Commission, San Jose Planning Department, Porter and Schwartz, and Bolt, Beranek and Newman.

4.9.3 Regional Setting

Napa County contains urban and rural areas. Most of the county is considered rural. Ambient noise levels in urban areas typically range from 60 to 70 dBA[1], while ambient noise levels are typically between 40 to 50 dBA in rural areas. Noise levels can range from 25 dBA in rural areas to as high as 100 dBA in industrial areas. Major noise sources in the county include highway traffic, trains, planes, and industry-related machinery. Napa County has several noise-sensitive areas, including urban residential zones, schools, hospitals, and wildlife management areas.

4.9.4 Project Setting

The primary and consistent source of noise in the vicinity of the proposed project originates from Napa County Airport. Most of the proposed project site is exposed to an average noise level of 60 dBA from noise generated from uses of the airport (Napa County 1996). The typical maximum intermittent noise from aircraft takeoffs experienced at the proposed project site ranges from 65 to 75 dBA (Napa County 1990).

Noise-generating activities within the proposed project site include the use of pumps, the processes of harvesting salt from the crystallizer beds, and the transportation of salt from stockpiles to barges. No ambient noise levels have been recorded at the site. Currently, actions are taken to reduce noise levels when pump number 2 is in use. This pump is located adjacent to the Napa River, across the river from the residential homes on Edgerley Island. Attenuation devices have been placed around the pump (Ransom and Paredes, pers. comm., 2005). Pump number 3 is used to move water into and out of Ponds 9 and 10. Due to its location near to the airport and other industrial facilities to the east of the proposed project site, noise generated by pump number 3 does not affect sensitive receptors. No other plant activities occur where specific sound attenuation actions are necessary.

A review of potential sensitive noise receptors such as schools, churches, childcare centers, healthcare facilities, and convalescent centers was conducted. No potential sensitive noise receptors were identified within 1 mile of the proposed project site. However, Milton Road has a residential community and mixed residential and industrial uses are located on Green Island Road. In excess of 80 residential receptors are located on Milton Road on the western bank of the

[1] dBA is the common measure for environmental sound in air.

Napa River and approximately 500 feet from the western boundary of the proposed project site. No other residential receptors are located beyond (to the west of) the Milton Road receptors. Approximately 10 mixed-use receptors are located on Green Island Road. These receptors are located in close proximity to the proposed water pipeline.

The mixed-use receptors on Green Island Road regularly experience elevated noise levels due to their proximity to the Napa County Airport. The "60 L_{dn}" noise contour line developed for the Napa County Airport includes the majority of the proposed project site and the mixed-use areas located on Green Island Road. The residences located on Milton Road are not located within the "60 L_{dn}" noise contour line.

The "60 L_{dn}" noise contour around Napa County Airport was developed "based on the level of operation, type of aircraft landing and taking off, and field measurement" (Napa County 1990). The typical intermittent noise from aircraft takeoffs near the runways is provided in Table 4.9-3.

Table 4.9-3
Approximate dBA levels for Napa County Airport

Aircraft	Distance (line of sight to aircraft)	Typical Maximum Level (dBA)
Single Engine Propeller	500 feet	75
Single Engine Propeller	1,200 feet	65
Twin Engine Propeller	800 feet	75
Twin Engine Propeller	1,500 feet	65
Falcon Jet (IASCO)	2,000 feet 4,000 feet	75 65

Source: Napa County 1990

4.9.5 Impacts and Mitigation Measures

4.9.5.1 Standards of Significance

Criteria based on the noise ordinance found in Sections 8.16.070 and 8.16.080 of the Napa County Code were used to determine the significant of noise impacts. The project would have a significant impact on noise if it would:

- Result in ambient noise levels at sensitive receptors that (1) exceed the noise standard for rural land uses (45 dBA between 10:00 pm to 7:00 am and 50 dBA between 7:00 am to 10:00 pm) for a cumulative period of more than 30 minutes in any hour, (2) exceed the noise standard for rural land uses by more than 5 dB for a cumulative period of more than 15 minutes in any hour, (3) exceed the noise standard for rural land uses by more than 10 dB for a cumulative period of more than 5 minutes in any hour, (4) exceed the noise standard for rural land uses by more than 15 dB for a cumulative period of more than 1 minute in any hour, (5) or exceed the noise standard for rural land uses by more than 20 dB for any period of time;

- Allow construction activities between 7:00 am and 7:00 pm that generate noise levels across a residential real property line of 75 dBA or higher; or
- Allow construction activities between 7:00 pm and 7:00 am that generate noise levels across a residential real property line of 60 dBA or higher.

4.9.5.2 Impacts and Mitigation Measures

Construction related to the proposed project would result in temporary, short-term increases in noise levels in the area of the proposed project. Project construction would occur in two phases, with a duration of 4 to 5 months each. Noise from construction would be generated by the broad array of powered, noise-producing mechanical equipment used in the construction process. This equipment would range from large generators and compressors to front-end loaders, haul trucks, compactors, and an excavator or a crane with a vibratory hammer to drive sheet pile wall. The exact complement of noise-producing equipment that would be in use during any particular period is difficult to predict. However, the noise levels from construction activity during the two major construction activities associated with the proposed project have been evaluated, and their use provides a good estimate of the potential noise impacts of the proposed project.

The evaluation of construction noise associated with the proposed project is based on typical noise level emissions from public works projects, as developed for the EPA (1971). Average noise levels associated with the two major construction activities where all pertinent equipment is present and operating at a reference distance of 50 feet are:

Ground Clearing	84 dBA
Excavations	88 dBA

Because of vehicle technology improvements and stricter noise regulations enacted during the last 30 years, actual noise levels from construction would be lower. However, to provide a worst-case estimate, the loudest construction phase noise levels shown above were used in this analysis. This information indicates that the overall noise level generated on the proposed project site during construction could be 88 dBA L_{eq} at a distance of 50 feet. This is an average value, typically the magnitude of construction noise emission varies over time because construction activity is intermittent and power demands on construction equipment (and the resulting noise output) are cyclical.

Noise levels generated by construction equipment (or by any "point source") decrease at a rate of approximately 6 dB per doubling of distance away from the source (Harris 1991). Therefore, if a particular construction activity generated average noise levels of 88 dBA at 50 feet, the L_{eq} at 100 feet would be 82 dBA, 76 dBA at 200 feet, and 70 dBA at 400 feet. This calculated reduction in noise level is based only on losses resulting from spreading of the sound wave as it leaves the source and travels outward, which is termed geometric spreading. The noise levels would continue to decrease at this rate due to geometric spreading (also referred to as the inverse square law effect). Shielding, such as buildings or levees, which block the line of sight, would attain an additional 5 dBA or more reduction. The effects of molecular air absorption and anomalous excess attenuation would reduce the noise level from construction activities at more distant locations at the rates of approximately 0.7 dBA and 1.0 dBA per 1,000 feet, respectively.

Construction related to the proposed project would result in temporary, short-term increases in noise levels at nearby residences. The nearest mixed-use (industrial and residential) area is located in close proximity to the proposed water pipeline. A maximum construction noise level of approximately 88 dBA L_{eq} would be experienced at the exterior of this mixed-use area. Noise levels of these magnitudes, although temporary, would be readily audible and would dominate the exterior noise environment in the area during the temporary construction operations.

PROPOSED PROJECT - TIDAL RESTORATION AND MANAGED POND

Impact N-1: Proposed project construction activities would generate noise levels above 75 dBA at nearby residential sites located on Green Island Road.

Significance: Less than significant

Mitigation: No mitigation required

Impact Analysis Discussion: Construction activities for the proposed project would generate noise during two construction seasons. Construction noise would be unavoidable but would be temporary and limited to the duration of project construction. Noise abatement measures would be incorporated into the proposed project to minimize construction noise impacts. These measures are discussed in Section 2.2.9 of this EIR. No sensitive receptors were identified within 1 mile of the proposed project site. The proposed project could generate unabated noise levels of 88 dBA L_{eq} during construction of the proposed water pipeline, which would affect receptors along Green Island Road. Construction activities associated with breaching of the levees for the proposed project would not likely generate noise levels above 75 dBA at the residential sites located on Milton Road. These described noise levels are exterior noise levels. Interior noise levels at the various mixed-use/residential sites would be lower. The majority of construction activities associated with the proposed project would not generate significant noise pollution at the residential receptors. Implementation of the noise abatement measures described in Section 2.2.9 of the EIR would make noise impacts to residential receptors less than significant.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Noise impacts for Alternative 1 are equivalent to the proposed project. No mitigation is required.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Noise impacts for Alternative 2 are equivalent to the proposed project. No mitigation is required.

ALTERNATIVE 3 – NO PROJECT

Under normal operating conditions, the No Project Alternative would not generate noise. Emergency repair construction activities would generate noise that would potentially affect residences depending on the repair location. The worst-case scenario would likely produce noise levels at approximately 88 dBA (68 dBA at 500 feet away). The existing levee structure surrounding a potential repair would shield the residences from some the noise-producing equipment and further reduce the noise pollution. No sensitive receptors would be affected.

4.10 PUBLIC SERVICES AND UTILITIES

4.10.1 Environmental Setting

4.10.1.1 Utilities

Utilities on the site of the proposed project consist primarily of overhead electrical power and buried gas lines, both supplied by Pacific Gas and Electric Company (PG&E). Due to its rural nature, only limited utility infrastructure is present on the site. However, pumping facilities and existing buildings require electrical connections. A PG&E gas main is located along Green Island Road, extending approximately 1 mile west of Highway 29 (Bovard, pers. comm., 2005). As-built drawings of all PG&E facilities, including overhead electrical, underground electrical, and underground gas, have been requested from PG&E for incorporation into the database for the proposed project and restoration construction drawings.

No on-site potable water or telephone service is available, and sewer utilities are connected to on-site septic systems.

The closest public sewer and water systems are owned and operated by the City of American Canyon Department of Public Works[1]. The City water line currently terminates on Green Island Road, approximately 1.2 miles from the existing entrance to the site.

4.10.1.2 Law Enforcement

The Napa County Sheriff's Department provides law enforcement services in the proposed project area. Currently nine Deputies, one Sergeant, and one Lieutenant who acts as Chief of Police are assigned to American Canyon, located just south of the proposed project area. Two officers are assigned to patrol a zone (Beat 2) 24 hours a day, seven days a week that includes Green Island Road and the project area.

4.10.1.3 Fire Protection

The Napa County Fire Department contracts with the California Department of Forestry for fire protection services including administrative coordination with nine volunteer fire departments operating under a County Fire Plan and supported by the County. The Department provides dispatching for the American Canyon Fire Protection District.

4.10.1.4 Solid Waste

Solid waste collected from the proposed project area is sent to Devlin Road Transfer Station in American Canyon. From there the recyclables are separated and the trash is transferred by rail to Washington State for ultimate disposal.

[1] http://www.ci.americancanyon.ca.us/Departments/Public_Works/section_index.htm

4.10.1.5 Mosquito Abatement

Regional and local mosquito abatement conditions are discussed in detail in Section 4.11 Public Health and Safety. The Napa County Mosquito Abatement District (NCMAD) staff regularly patrols the proposed project site. Currently, treatment occurs on a very small portion of the proposed project site. The salt ponds do not provide mosquito habitat. Ponded and vegetated areas not used for salt production (e.g., drainage ditches, borrow pits adjacent to the railroad tracks, etc.) are treated. The issue for discussion in this section "Public Services and Utilities" is the potential need for changes in the level of public service provided by the NCMAD resulting from the proposed project.

4.10.2 Impacts and Mitigation Measures

4.10.2.1 Standards of Significance

The following standards of significance are based on CEQA Guidelines, Appendix G. For the purposes of this EIR, public service and utility impacts are considered significant if implementation of the proposed project would:

- Result in substantial adverse physical impacts associated with (a) the provision of new or physically altered governmental facilities whose construction could cause significant environmental impacts; (b) the maintenance of acceptable service ratios, response times, or other performance objectives for any of the public services
- Result in the need for new or expanded water supply entitlements

The proposed project would not result in a significant increase in the need for law enforcement, fire protection, or emergency medical services. In addition, the proposed project would not result in any new connection to a stormwater drainage system or wastewater treatment facility, nor require any new electrical, gas, or telecommunication lines. Therefore, the proposed project would result in no impacts to these services and utilities. The proposed project would increase the need for solid waste disposal in the project area. It is anticipated that approximately 4 cubic yards of solid waste would require disposal each week. Therefore, the proposed project would not result in a significant impact associated with solid waste disposal. These criteria are not used in this analysis.

4.10.2.2 Impacts and Mitigation Measures

The proposed project would increase public access to and recreational use of the project area. It is anticipated that the proposed project's recreation amenities may attract approximately 350 visitors per week. Gates on the site access road would be used to restrict public vehicle access to daylight hours. A DFG employee would reside in the existing residential housing on Green Island. The DFG warden for the NSMWA would patrol the site on a regular basis. The increased use is not considered substantial and would not result in a significant increase in the need for law enforcement, fire protection, or emergency medical services. In addition, the proposed project would not result in any new connection to a stormwater drainage system or wastewater treatment facility, nor require any new electrical, gas, or telecommunication lines. Therefore, the proposed project would result in no impacts to these services and utilities. The proposed project would increase the need for solid waste disposal in the project area.

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

PSU-1: Construction of the water supply pipeline	The proposed project would require construction of a water supply pipeline extension to the project site.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: The proposed project would result in the construction of a new approximately 4,750-foot water supply pipeline extension to bring potable water to the site from the City of American Canyon water utility. The new water supply line would provide water to DFG facilities on Green Island and public access and maintenance buildings. This new water supply line to the site of the proposed project would not result in a need for expanding the City's water treatment facilities nor require new or expanded water supply entitlements. Therefore, this impact would be less than significant.

PSU-2: Increased demand on public services	The proposed project may increase the need for the County's Mosquito Abatement services.
Significance:	Potentially significant
Mitigation PSU-2:	The proposed project sponsors will coordinate with NCMAD during the design, implementation, and operations phases of the proposed project. DFG will consult with NCMAD during the project design phase to incorporate design elements to reduce the mosquito production potential of the proposed project.
Residual Significance:	Less than significant

Impact Analysis Discussion: As discussed in Section 4.11, Public Health and Safety, the tidal portions of the site would evolve from being predominantly mudflat to vegetated marsh over time. Intertidal mudflat drains daily and, thus, does not provide mosquito habitat. As vegetation becomes established on the site potential mosquito habitat may increase. During the time that the site is at or below MHW it still is predicted to drain well, even as vegetation begins to establish. The marsh plain is predicted to be above MHW at approximately 65-73 years after breaching. This mature marsh plain has potential to include isolated pools and shrink/swell cracks surrounded by vegetation, which could serve as mosquito breeding habitat. The areas most likely to provide mosquito habitat are the existing transfer and brine ditches, which currently contain stagnant areas lacking effective drainage. The proposed project would lower the levees adjacent to these ditches, using the excess material to fill the lower portion of the ditches, thereby enhancing ditch drainage and decreasing mosquito habitat. The perimeter levees would facilitate NCMAD treatment procedures by providing good perimeter access to the tidal marshes and perimeter drainage ditch. In addition, the boat-launching ramp in the barge channel provides aquatic access.

The managed pond would remain open water and as such would provide minimal mosquito larval habitat. In the unlikely event of a mosquito-breeding problem the managed pond would be

able to be fully drained using the gated water control structures. This management option would eliminate the potential for significant vector control issues to develop in the managed pond.

Implementation of Mitigation Measure PSU-2 would reduce this impact to less than significant.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Public service and utility impacts for Alternative 1 are equivalent to the proposed project. Mitigation measures are analogous to the proposed project.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Public service and utility impacts for Alternative 2 are equivalent to the proposed project. Mitigation measures are analogous to the proposed project

ALTERNATIVE 3 – NO PROJECT

Under Alternative 3, the No Project Alternative, no increased demand for public services would occur and the new water supply pipeline would not be built. (Existing mosquito abatement activities are discussed in 4.11 Public Health and Safety section. No change in conditions relative to mosquito larval production is anticipated under the No Project Alternative.)

4.11 PUBLIC HEALTH AND SAFETY

4.11.1 Regional Setting

4.11.1.1 Mosquitoes

The NSMPR EIR (CSCC and CDFG 2004) provides a summary of regional mosquito abatement issues. This summary is provided below and has been supplemented or modified with additional information where applicable.

Compared with the historical levels of mosquito-borne diseases in humans, levels of mosquito-borne diseases in California are low. These diseases, including encephalitis and malaria, however, are still present or could be readily reintroduced. (Bohart and Washino 1978; Sacramento-Yolo County Mosquito Abatement and Vector Control District 1990.)

All species of mosquitoes require standing water to complete their growth cycle. Any body of standing water represents a potential mosquito-breeding site. Areas that pond surface water and are flushed by daily tides are not stagnant for periods sufficient for mosquito larvae to mature; therefore, such areas are not mosquito production sources, and are not of concern to mosquito abatement districts (Maffei, pers. comm., 2002).

Water quality affects the productivity of a potential mosquito-breeding site. Typically, greater numbers of mosquitoes are produced in water bodies with poor circulation, higher temperatures, and higher organic content (and therefore with poor water quality) than in water bodies having good circulation, lower temperatures, and lower organic content (Collins and Resh 1989). Irrigation and flooding practices may also influence the level of mosquito production associated with a water body. Typically, greater numbers of mosquitoes are produced in water bodies with water levels that slowly increase or recede than in water bodies with water levels that are stable or that rapidly fluctuate (California State Water Resources Control Board and U.S. Army Corps of Engineers 1995). Additionally, the types of vegetation growing in standing ponds can have major effects on mosquito production. For instance, mosquitoes will not reproduce in areas with an abundance of California cordgrass due to full tidal draining, but they will reproduce in isolated ponds or ponded cracks in saltgrass and pickleweed communities (Maffei, pers. comm., 2002).

Mosquitoes are adapted to breed during periods of temporary flooding and can complete their life cycles before water evaporates and predator populations become well established. Poor drainage conditions that result in ponding water and water management practices associated with the creation of seasonal wetlands for waterfowl use result in the types of flooding that can produce problem numbers of mosquitoes (California State Water Resources Control Board and U.S. Army Corps of Engineers 1995).

Permanent bodies of open water that have good water quality (good circulation, low temperatures, and low organic content) typically sustain stable nutrient content and support rich floral and faunal species diversity, including mosquito predators and pathogens. Wave action across larger bodies of water physically retards mosquito production by inhibiting egg-laying and larval survival (California State Water Resources Control Board and U.S. Army Corps of Engineers 1995).

Areas near the project site that contain potential mosquito habitat include a large area of standing water along Green Island Road; areas around Napa County Airport, ditches east of the project site, irrigated pastures, ditches on Edgerly Island, American Canyon Wastewater Treatment Plant, the wetlands to the north, south, and east of the project site; and drainage ditches that generally run adjacent to roadways in the area. All of these areas receive treatment by NCMAD. NCMAD uses biorational pesticides to treat for mosquitoes, which are non-detectable after 48 hours. Treatment is not required in the mudflats adjacent to the project site on the Napa River (Varner, pers. comm., 2005).

4.11.1.2 Flooding

Flooding and Napa County's flood control program are described in Section 4.6.3.4. Though flooding of the Napa River and its tributaries can pose a serious threat to public health and safety, no serious threat occurs in the floodplain lands adjacent to the project site. These areas are wetlands, which generally flood during heavy rains. The developed areas are located above the 100-year flood recurrence elevation of 9.56 feet NAVD 88.

4.11.1.3 Airport Safety

Napa County Airport is located immediately east of the North Unit of the proposed project. Napa Auxiliary Air Defense Field was constructed in 1942 as a military airfield and deeded to Napa County in 1945 (Baily, n.d.). At that time wetlands occupied areas to the northwest, west, and southwest of the airfield. These areas remain wetlands or aquatic features to this day, including: the freshwater oxidation ponds of the Napa Sanitation District, the tidal marshes in Bull Island and Fagan Marsh Ecological Reserve, and the salt ponds of the project site (Figure 1-1). FAA's Advisory Circular number 150/5200-33 recommends locating *airport development projects* 10,000 feet away from hazardous wildlife attractants for airports serving turbine-powered aircraft. [Note: The proposed project is not an airport development project. However, if it were an airport development project that needed mitigation for special-status species then the circular allows an exception for placement of special-status species habitat *within* the 10,000-foot radius. The proposed project will create habitat for multiple special-status species.] All the wetland and aquatic area described above are within a 10,000-foot radius of the end of Runway 6/24 (Figure 4-7) and have been there since the airfield was established. In addition, wetlands are located on airport property at the ends of both Runways 6/24 and 18R/36L.

The FAA recommends the 10,000-foot buffer because wildlife can pose a safety threat to aircraft, particularly during take-off and landing. Bird strike reports for incidents recorded at Napa County Airport between May 2003 and May 2005 are provided in Appendix E (Kennedy, pers. comm., 2005) and are summarized in Table 4.11-1. A total of 5 incidents were reported during this period, all on the 18R flight patterns. Runway 18R/36L is the primary runway, with air traffic switching to Runway 6/24 during specific wind conditions. The reports cite aircraft hitting small birds, ducks, and geese. No damage to aircraft was reported. The flocks of small birds were likely Brewer's blackbirds[1] associated with habitat provided by the vineyards located

[1] Based on the description of "martins" contained in the hazard report. Martins are dark colored birds as are Brewer's blackbirds. Neither martins nor Brewer's blackbirds are likely use the salt pond habitat although the blackbirds may forage in the ruderal levee vegetation. Brewer's blackbirds are known to form large flocks.

east of Pond B2. Ducks and geese have been observed on the airport property, and are considered to be a hazard with regard to aviation operations (Shannon, pers. comm., 2005). Actions have been taken to discourage migratory waterfowl and geese from using the airport property as habitat (Shannon, pers. comm., 2005).

Table 4.11-1
Summary of Bird Strike Incidents Reported at Napa County Airport Between May 2003 and May 2005

Date	Incident	Runway	Damage	Bird Type
5/13/05	Aborted take-off	18R (take-off)	None	Goose
2/27/05	Hit wing and engine inlet lip	18R	Not determined	Ducks
12/28/04	Birds ingested into two jet engines	18R (landing)	"Pilot reported engines may not be damaged"	Flock of small birds
12/24/03	Aborted take-off (engine #1 and wing/rotor struck)	18R (take-off)	None stated	Flock of 11 to 100 small birds (martins?)
5/18/03	Hit geese on take-off	18R (take-off)	None	Goose

Napa County Airport is considering lengthening the 6/24 RSA to 1,000 feet and designating a RPZ on the next thousand feet to comply with FAA guidance (Figure 4-7). The RSA and RPZ would extend into Pond 10 in the North Unit of the proposed project. The proposed project includes placement of fill to create upland on approximately 9 acres located in the corner of Pond 10 that the airport could later use to construct a RSA. The DFG will continue working with Napa County Airport as the airport plans its enhanced safety features.

4.11.2 Project Setting

4.11.2.1 Mosquitoes

From 1925, when NCMAD was established, until 1952 when the proposed project site was used for salt production, the site was a source of mosquitoes. During this time, NCMAD used diesel oil and dichlorodiphenyltrichloroethane (DDT) for mosquito abatement (Varner, pers. comm., 2005). Today, NCMAD regularly patrols the proposed project site. Treatment occurs on ponded and vegetated areas not used for salt production (e.g., drainage ditches, borrow pits adjacent to the railroad tracks, etc.). Mosquito larvae do not populate the salt ponds of the proposed project site because of the high salinity and open water surface conditions (Varner, pers. comm., 2005).

4.11.2.2 Flooding

According to FEMA's Flood Insurance Rate Map, which was last revised on September 15, 1989, the project site is located in the Napa River floodplain. The site is completely within Flood Zone A1, meaning that it lies in the 100-year floodplain where the base flood elevation has been determined to be 7 feet above MSL. Under the current uses of the project site, its location in the floodplain is not a concern in terms of public health and safety.

4.11.2.3 Airport Safety

Data from USGS bird surveys conducted in the proposed project area between April 2003 and February 2005 are summarized in Tables 4.2-2 and 4.2-3 and provided in Appendix C. Surveys noted species and number present, but bird behaviors were not recorded. The bird surveys were conducted during the same period covered by the bird strike reports summarized above. Departing aircraft using the basic flight pattern associated with Runway 6/24 fly over Ponds 10, W2, and W1 at elevations less than 1,000 feet. The basic flight pattern for landing on this runway routes aircraft over the proposed project site. Over the course of 18 census events conducted during this period, 269 birds were recorded in Pond 10. No data were recorded for Ponds W2 and W1. All of the birds recorded in Pond 10 were small shorebirds including the following species: western sandpiper (188), dunlin (40), black-bellied plover (31), and least sandpiper (10). No bird strikes were reported by aircraft using this runway and basic flight pattern.

Departing aircraft using the basic flight pattern for Runway 18R/36L are at approximately 600 to 1,000 feet above ground when they pass over South Unit Ponds B2 and Unit 3 at the proposed project site. The basic flight pattern for landing on this runway routes aircraft over the proposed project site. Nearly half of the birds observed during the 18 census events were recorded in Pond B-3, located south of this alignment. Birds observed in the survey included multiple species of long- and short-legged wading birds such as small-bodied and small-billed birds including sandpipers, stilts, and avocets. Low-flying, large-bodied, large-billed birds such as great blue heron and great egret were observed as well as high-flying larger birds including red tailed hawk and turkey vultures. It is birds in flight, and not roosting on the ponds, that pose a potential hazard to aircraft; however, the number of birds on the ponds suggests the potential for birds to be crossing an aircraft's flight path.

The animals and birds that cause the worst damage to aircraft are deer, vultures, geese, cormorants/pelicans and cranes (FAA 2004). The composite hazard ranking of the birds observed on the proposed project site is listed in Table 4.11-2 below. The FAA composite ranking is the relative hazard to aircraft of 25 species or groups of wildlife. Dolbeer (2005) analyzed data from 1990–2004 in the National Wildlife Strike Database for Civil Aviation in the United States and found 74 percent of wildlife strikes occur at altitudes at or below 500 feet. This is the elevation of aircraft on the Runway 6/24 basic flight pattern where no bird strikes have been reported. Aircraft departing from Runway 18R/36L will be at elevations between 600 and 1,000 feet when they first fly over the South Unit of the proposed project and will continue increasing their elevation as they pass over the site. Birds most frequently struck above 500 feet were waterfowl, gulls/terns, passerines, and vultures. Aircraft departing from Runway 6/24 will be at elevations less then 500 feet while passing over Ponds 10, W2, and W1. Birds most frequently struck below 500 feet were passerines, gulls/terns, pigeons/doves, and birds of prey (Dolbeer 2005).

Table 4.11-2
Number of Birds Observed Between April 2003 and February 2005 at the Proposed Project Site and Their Relative Hazard Ranking to Aircraft

Common Name	Scientific Name	Number of Birds Observed (USGS 2005)	FAA Relative Hazard Composite Ranking* (FAA 2004)
American avocet	*Recurvirostra americana*	67	19
Black-bellied plover	*Pluvialis squatarola*	176	19
Black-necked stilt	*Himantopus mexicanus*	11	19
California gull	*Larus californicus*	15	12
Dowitcher sp.	*Limnodromus* sp.	27	19
Dunlin	*Calidris alpina*	311	19
Great blue heron	*Ardea herodias*	4	10
Great egret	*Ardea alba*	1	10
Greater yellowlegs	*Tringa melanoleuca*	52	19
Gull	*Larus* sp.	385	12
Horned lark	*Eremophila alpestris*	3	16
Killdeer	*Charadrius vociferus*	5	19
Long-billed curlew	*Numenius americanus*	4	19
Least sandpiper	*Calidris minutilla*	177	19
Mallard	*Anas platyrhynchos*	2	7
Northern harrier	*Circus cyaneus*	1	11
Ringed-billed gull	*Larus delawarensis*	75	12
Red-tailed hawk	*Buteo jamaicensis*	1	11
Semi-palmated plover	*Charadrius semipalmatus*	118	19
Western snowy plover	*Charadrius alexandrinus nivosus*	2	19
Stilt sandpiper	*Calidris himantipus*	1	19
Turkey vulture	*Cathartes aura*	3	2
Western sandpiper	*Calidris mauri*	624	19
Willet	*Catoptrophorus semipalmatus*	140	19

Note:

* The hazard composite ranking scale ranges from 1 to 25. A hazard ranking of 1 is the most hazardous.

4.11.3 Impacts and Mitigation Measures

4.11.3.1 Standards of Significance

The following criteria were used to determine significant public health and safety effects. A public health and safety impact is considered significant if the project would:

- Be located within an airport land use planning area and would result in a safety hazard for people residing or working in the project area or for operations of aircraft using the airport.
- Result in increasing habitat for disease vectors.

The proposed project would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The proposed project would be approximately 91 percent wetland with either standing water or exposed to the tides. The upland area includes 86 acres of levees adjacent to the tidal areas and 46 acres of predominantly barren uplands. These lands are very unlikely to sustain wildland fires. In addition, the project site is not in an urbanized area. Therefore, these criteria are not used in this analysis.

4.11.3.2 Impacts and Mitigation Measures

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

PHS-1: Airport land use and safety	The proposed project would be located in an airport land use planning area and could result in a safety hazard for operations of aircraft using the airport.
Significance:	Significant
Mitigation PHS-1:	PHS-1a Excavate tidal channels into the site to enhance draining, reduce areas of standing water, and thereby reduce waterfowl use of the site PHS-1b Increase the surface elevation of the ponds underneath the basic flight pattern of Runways 6/24 and 18R/36L to hasten vegetation establishment, reducing the use of the site by flocking shorebirds and waterfowl
Residual Significance:	Significant and unavoidable

Impact Analysis Discussion: The purpose of the proposed project is to create wildlife habitat. This purpose is inherently in conflict with aircraft safety; however, mitigation measures can be implemented to reduce the impacts. Avian use of the site occurs now and on all the wetlands located west of Napa County Airport including on the proposed project site. Bird use would change after the proposed project is constructed because of changes in habitat. Two primary habitat changes would occur: the introduction of tidal action to the North, Central, and South units and the creation of a managed pond in the South Unit. The areas with newly introduced tidal action would begin predominantly as intertidal mudflat and evolve into tidal marsh. Existing ground-surface elevations in portions of Ponds W1, W2, and B1–B3 are suitable for rapid colonization by emergent vegetation soon after breaching. Section 2.2.1.1 describes the predicted accretion of sediment and the colonization of marsh vegetation on the site. Modeling suggests that elevations suitable for vegetation establishment on the remainder of the areas would occur after 4 years of tidal action in the Central Unit, after 9-10 years in the North Unit, and after 10-12 years in the South Unit.

The bird species that would likely use the site after tidal action is introduced and prior to vegetation establishment are similar to the species that currently use the site (Table 4.11-2) Most of the species are shorebirds with a hazard ranking of 19 out of 25. Most of the shorebirds fly in

flocks, at elevations below 500 feet when flying between foraging sites. It is likely that additional species of waterfowl would also use the proposed project area. As the site becomes vegetated the avian population would change. Typical species of birds inhabiting the vegetated tidal marsh include San Pablo song sparrow, common yellowthroat, marsh wren, and California black and clapper rails. None of these are flocking birds. The first four species are small-bodied, low-flying birds and the clapper rail, while larger, seldom flies and when it does the flight pattern is low to the ground. As the marsh becomes vegetated the species and behavior of the birds should result in a reduced wildlife hazard threat to aircraft departing from Napa County Airport.

Two design features would mitigate the species and abundance of birds that use the proposed project area: (1) constructing tidal channels well into the sites to assist site drainage on each tide and (2) adding fill to select portions of the project area to accelerate revegetation and influence the avian community using the site to self-select for smaller, nonflocking birds.

The managed pond design and operation would influence its use by birds. It would be open water with islands, providing habitat for shorebirds and waterfowl. The purpose of the managed ponds is to create sustainable open-water habitat in close proximity to public access areas, facilitating environmental educational and interpretive opportunities after the remainder of the proposed project site has become vegetated marsh. Shorebird and waterfowl abundance in the managed pond would be limited by the size of the area and influenced by two sources of temporal variation: tidal action and migration patterns. Shorebird migration occurs during spring and fall and waterfowl migration occurs during winter. Shorebirds and waterfowl may use the managed pond for foraging and roosting when high tide inundates foraging grounds on the river's intertidal mudflats.

PHS-2: Disease vector impact	The proposed project has the potential to increase habitat for disease vectors.
Significance:	Potentially significant
Mitigation PHS -2:	Same as Mitigation PHS-1.
Residual Significance:	Less than significant

Impact Analysis Discussion: As discussed above, the tidal portions of the site would evolve from being predominantly mudflat to vegetated marsh over time. Intertidal mudflat drains daily and, thus, does not provide mosquito habitat. As vegetation becomes established on the site potential mosquito habitat may increase. During the time that the site is at or below MHW it still is predicted to drain well, even as vegetation begins to establish. The marsh plain is predicted to be at MHW at approximately 65-73 years after breaching. This mature marsh plain has potential to include isolated pools and shrink/swell cracks surrounded by vegetation, which could serve as mosquito breeding habitat. The areas most likely to provide mosquito habitat in the near term are the existing transfer and brine ditches, which currently contain stagnant ponded areas and would lack effective drainage. The proposed project would lower the levees adjacent to these ditches, using the excess material to fill the lower portion of the ditches, thereby enhancing ditch drainage and decreasing mosquito habitat. These levees would also be breached in numerous locations to facilitate drainage. The perimeter levees would facilitate Napa County Mosquito Abatement District (NCMAD) treatment procedures by providing good perimeter access to the

tidal marshes and perimeter drainage ditch. In addition, the boat-launching ramp in the barge channel provides aquatic access.

The managed pond would remain open water and as such would provide minimal mosquito larval habitat. In the unlikely event of a mosquito-breeding problem the managed pond would be able to be fully drained using the gated water control structures. This management option would minimize the potential for significant vector control issues to develop in the managed pond.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Public health and safety impacts for Alternative 1 are equivalent to the proposed project. Mitigation measures are analogous to the proposed project. The impact of this alternative on airport land use and safety would be somewhat less than the proposed project because the entire project area would eventually be occupied by tidal marsh vegetation and its associated channel network, and therefore would provide minimal habitat for large numbers of waterfowl and shorebirds. Conversely because the entire area is tidal there is slightly more mosquito breeding area in the long term.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Public health and safety impacts for Alternative 2 are equivalent to the proposed project. Mitigation measures are analogous to the proposed project. The impact of this alternative on airport land use and safety would be somewhat greater than the proposed project because the playa would provide additional open water habitat suitable for waterfowl and shorebirds during the rainy season and into spring until evaporation dried the area. The open water habitat in the playa area would create less mosquito breeding habitat than is present in the proposed project.

ALTERNATIVE 3 – NO PROJECT

Under the No Project Alternative, the perimeter levees would be maintained, however tidal action would not be restored in any part of the project site. As a result, the site would function as playa (i.e., seasonal ponds) that would fill from direct precipitation and dry out during the summer months. The ponds would, therefore, continue to attract waterfowl and shorebirds in winter and spring. These birds have the potential to cause a bird strike hazard. The No Project Alternative does not have the potential to *increase* habitat for disease vectors; however; existing habitat in the ditches and seasonal wetland will remain.

4.12 PUBLIC ACCESS/RECREATION/VISUAL

4.12.1 Regulatory Setting

4.12.1.1 Recreation and Public Access

The Napa County General Plan has policies that pertain to the establishment, enhancement, and maintenance of recreational opportunities on county lands. The Napa County General Plan policies that relate to recreation include:

- Return salt extraction ponds to marshlands or other non-urban uses for recreation, fisheries, and wildlife habitat at the termination of salt extraction activity.
- Encourage wildlife habitat improvements for hunting or nonconsumptive wildlife uses such as photography and maintaining food chains and checks and balances of natural habitat.
- Provide recreational and open-space opportunities… by maximizing scenic and wildlife habitats by retaining natural vegetation, installing supplementary landscaping, acquiring additional land for open space purposes and by shaping the structures to have a more attractive form and greater usefulness for open space activities.
- Promote development of local State Parks for recreation.

The Association of Bay Area Governments adopted the Bay Trail Plan in 1989, in support of the Bay Plan's goal of increasing public access to the Bay and its shorelines. Once completed, the Bay Trail will be a 400-mile continuous recreation corridor around the Bay, linking nine counties and 47 cities (see Section 4.8, Agricultural Resources, Land Use and Planning).

Napa County Department of Public Works prepared an Airport Area Bicycle Route Study (LandPeople et al. 2005) that identifies future bicycle and pedestrian routes through the City of Napa and the unincorporated area of Napa County from Streblow Drive south to Green Island Road with the goal of connecting to existing and proposed facilities in the City of American Canyon and the City of Napa. Several of these proposed routes are within the vicinity of the proposed project.

The City of American Canyon Community Services Department has developed a Wetlands Edge Bay Trail Concept Plan (LandPeople et al. 2002). This plan evaluates alternative routes for the Bay Trail through American Canyon, focusing on the portion of the trail from Eucalyptus Drive north to Green Island Road.

4.12.1.2 Visual Resources

The Open Space Element of the Napa County General Plan states as one of its goals "Land use patterns should include visual consideration. The landscape can easily become a hodge-podge of rooftops, shining mobile homes, power lines and poles. Therefore, the appropriate density and cluster subdivision design form should be carefully planned."

4.12.2 Regional Setting

About 23 percent of the land in the North Bay region (made up of parts of Solano, Napa, Sonoma, and Marin Counties, including the cities of American Canyon, Novato, San Rafael, and Vallejo) is used for open space and recreation (San Francisco Bay Conservation and Development Commission 1997). Larger pockets of this land used for open space and recreation can be found in Napa and Solano counties south and east of Skaggs Island Road; in Napa County south of Napa Slough; in Marin County north of State Route 37 and north of Atherton Avenue; and in Marin County east of Highway 101 and south of Ignacio Boulevard.

4.12.2.1 Recreation and Public Access

The proposed project site is an area of salt ponds, baylands, tidal sloughs, and wetland habitat located primarily between Fagan Marsh to the north; Napa River to the west and south; and Napa County Airport, the closed American Canyon landfill and private lands to the east. The region surrounding the proposed project area is accessed by multiple users, including motorists, bicyclists, hikers, birdwatchers, anglers, duck hunters, and motorized and nonmotorized watercraft. Two duck clubs are located across the river. The Can Duck Club leases Pond 2 from DFG for hunting and fishing; 50 households are members of the club. Hunting occurs mainly on the northern portion of Pond 2. Also a privately held duck club is located on the northeastern portion of Pond 6A.

Regional recreation facilities include the following:

- John F. Kennedy Memorial Park on the Napa River, Streblow Drive, Napa
- American Canyon Community Park #1, Napa Junction Road, American Canyon
- Bay Area Ridge Trail, State Route 121 at Streblow Drive, Napa
- Napa-Sonoma Marshes Wildlife Area (NSMWA), Napa, which includes the following units:
  - Huichica Creek Unit
  - Ringstrom Bay Unit
  - Wingo Unit
  - Napa River Unit
- Skyline Wilderness Park, Napa
- Future Planned Trails: Green Island Road and Tower Road Areas, Eucalyptus Drive, Wetlands Edge Road, American Canyon
- Hudeman Slough, south of Ramal Road
- Tolay Creek and Tubbs Island (San Pablo Bay National Wildlife Refuge), just southeast of the intersection of State Routes 121 and 37
- Bay Trail, along State Route 37

Two proposed alignments of the Bay Trail surround the northern and eastern boundaries of the proposed project area. The eastern alignment is east of the Napa River. One of the proposed Bay

Trail alignments is proposed on Green Island Road and adjacent to Napa County Airport. Additional Bay trail segments are planned to parallel State Highways 29 and 221.

4.12.2.2 Visual Resources

The North Bay region is surrounded on the west, north, and east by the California Coastal Ranges and on the south by San Pablo Bay. Visual resources adjacent to San Pablo Bay vary from rural to urban. Grazed and farmed baylands, vineyards, marsh and other open space, and rural residences and farm support structures crisscross rural areas. Urban area visual resources include industrial and residential developments and associated infrastructure. Also, numerous creeks, sloughs, marshes, and rivers drain into San Pablo Bay and the Napa River, adding a distinctive element to the region's visual character.

4.12.3 Project Setting

4.12.3.1 Recreation and Public Access

No recreational use of the NPSR Project lands occurs because access to the site is limited while Cargill continues its salt-harvesting phase-out operation. Green Island Road is open to the public and provides access to the Napa River levee for fishing and hand launching of watercraft.

DFG is preparing a draft recreation and public use plan for the NSMWA. This document will be incorporated into the NSMWA Management Plan. The recreation plan is expected to focus on improvement of public access and educational opportunities. The plan may include improving internal roads, constructing fishing platforms on restored ponds, improving footpaths, and repairing parking lots, picnic areas, small-scale restroom facilities, interpretive signs, and display boards.

4.12.3.2 Visual Resources

Visual resources in the proposed project area are primarily rural with the exception of Napa County Airport, and include marsh, salt pond, vineyard, and other undeveloped open space. The habitat restoration alternatives would occur within salt ponds and be surrounded by Fagan Marsh, the NSMWA, privately held parcels, and associated creeks, sloughs, marshes, and the Napa River. Unincorporated Napa County and the City of American Canyon lie to the east and southeast of the salt ponds.

4.12.4 Impacts and Mitigation Measures

4.12.4.1 Standards of Significance

The following standards of significance are based on CEQA Guidelines, Appendix G. For the purposes of this EIR, an impact to recreation would be considered significant if the implementation of the proposed project would:

- Propose the construction of recreation facilities or require the expansion of recreation facilities, which might have an adverse physical effect on the environment.

The proposed project would not increase the use of existing neighborhood and regional parks or other recreation facilities such that substantial physical deterioration of the facility would occur or be accelerated, conflict with existing or planned recreational use and recreation policies, or conflict with existing or planned public access plans. Therefore, these criteria were not used in this analysis.

The following standards of significance are based on CEQA Guidelines, Appendix G. For the purposes of this EIR, the proposed project would have a significant impact with regard to aesthetics if it would:

- Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

The proposed project would not have a substantial adverse effect on a scenic vista, substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, or substantially degrade the existing visual character or quality of the site and its surroundings. Therefore, these criteria were not used in this analysis.

4.12.4.2 Impacts and Mitigation Measures

Implementation of the proposed project would not result in an increase in the use of existing neighborhood and regional parks or other recreation facilities such that substantial physical deterioration of the facilities would occur or be accelerated. The proposed project would not conflict with existing or planned recreational use and recreation policies or with public access plans. In addition, implementation of the proposed project would not have a substantial adverse effect on a scenic vista or substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Therefore, these issues are not discussed further in this section.

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

Construction of recreational facilities (PARV-1):	The proposed project includes the construction of recreation facilities, which might have an adverse physical effect on the environment.
Significance:	Potentially significant
Mitigation PARV-1:	Same as BIO-1a through BIO-4
Residual Significance:	Less than significant

Impact Analysis Discussion: The proposed project would utilize upland areas for site access and public access facilities. A new access road to the site would be constructed that would be raised to prevent flooding. Public access and recreation components would include a primary staging area for parking, picnicking, restrooms, trails, and boat launching centered around the barge channel. Construction of these facilities could cause impacts to existing biological resources. These impacts are discussed in Section 4.2.5 of this EIR. Mitigation Measures BIO-1 through BIO-4 would reduce these potential impacts to less than significant.

Project Benefits*:* Public access facilities are lacking in the vicinity of the proposed project. This reach of the Napa River and adjacent lands do not include public facilities for boat launching[1], trails for hiking or bicycling, or picnic grounds. The proposed project area is also a missing link in the San Francisco Bay Trail system. A perimeter trail would be developed to support both pedestrians and cycling. The trail has the potential to connect with the Bay Trail, the City of American Canyon Wetlands Edge Trail, and the proposed Airport Bicycle Trail. The proposed project team is working with the City of American Canyon to coordinate trail connection opportunities near the end of Eucalyptus Road. Opening access to the launch ramp and dock, constructing the trail, and other recreational facilities would be a beneficial recreation impact.

Impact of a new source of light on nighttime views (PARV-2):	The proposed project would introduce a new source of substantial light that could affect nighttime views in the area.
Significance:	Less than significant
Mitigation:	Focus new site lighting in a downward direction

Impact Analysis Discussion: The proposed project would include exterior lighting in the parking lot. Upward directed lighting and excess site lighting can contribute to atmospheric light pollution that could result in adverse effects such as annoyance, discomfort, loss of visibility, and/or disturbance of nighttime views. As part of the proposed project, all outdoor lighting will utilize directional lighting methods with shielded and cutoff type light fixtures to minimize glare and upward directed lighting. Therefore, this impact would be less than significant.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Public access, recreation and visual impacts and mitigation for Alternative 1 are equivalent to the proposed project.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Public access, recreation and visual impacts and mitigation for Alternative 2 are equivalent to the proposed project

ALTERNATIVE 3 – NO PROJECT

Under the No Project Alternative none of the impacts or benefits associated within constructing the public access and recreation improvements would occur. No light and glare impacts would be associated with the proposed parking area lighting. In the absence of the proposed project, the Napa Plant Site would be characterized by an environment similar to the playa habitat described in Alternative 2. The majority of the seasonal ponds would be devoid of vegetation because of the prolonged duration of inundation and residual salinity. The barge channel would fill with sediment, reducing access to the river from the dock and launch ramp.

[1] Cuttings Wharf Marina is on the west bank of the river.

4.13 TRANSPORTATION

4.13.1 Regional Setting

The site is located at the north end of San Pablo Bay, which is part of the Bay-Delta estuary. Interstate 80 and SRs 37, 29, 12, 121, and 221 provide regional access to the North Bay. Interstate 80 is a principal southwest-northeast freeway that connects SRs 12, 29, and 37 to the Bay Area in the southwest and to Fairfield in the northeast. SRs 29 and 12 are the closest regional access routes to the site. SR 12 is to the north of the site and runs in an east-west direction. SR 29 is to the east of the site and runs in a north-south direction. Refer to Figure 1-1 for a map showing most of the regional routes in the area.

The Caltrans Office of Traffic Data maintains records of the annual average daily traffic level for SR 29. Peak-hour traffic is one criterion that determines the operational ability and efficiency of a roadway. The peak-hour traffic flow along SR 29 near the junction with SR 12 is 3,970 vehicles and at SR 29 and Green Island Road it is 3,600 vehicles (Caltrans 2005). In 1999, the Napa County Transportation Planning Agency produced a report titled, *Strategic Transportation Plan–1999* that identifies regional transportation projects. Several roadway/traffic improvements were identified along SR 29 to the east of the site. The report identified a need to improve the intersection of SR 29, SR 12, and Airport Road; improve the intersection of SR 29 and American Canyon Road; and increase the capacity of SR 29 between the Solano County line and SR 12. The intersection of SR 29, SR 12, and Airport Road was improved in 2004. The other projects are still in the planning phase of project development (City of Napa 2005; NCTPA 1999).

4.13.2 Project Setting

4.13.2.1 Existing Roadway Network

Green Island, Airport, and Eucalyptus roads are public roadways that provide access into or near the proposed project site. These roadways are accessed by SR 29. Green Island Road is the only public road that provides access into the site. This roadway parallels the eastern border of Ponds B1 and W2 and bisects the northern portion of the site, running between Ponds 9 and 10 and Ponds W1 and W2. Green Island Road is lightly traveled and is used primarily by agricultural vehicles, vehicles accessing adjacent industrial facilities, and vehicles accessing local residences. The road terminates near the Napa River. Airport and Eucalyptus roads provide access to the northeast and southeast portions of the site, respectively. These roadways terminate near the boundary of the site and do not enter into the site. Airport Road is primarily used for access to Napa County Airport, Napa County Airport Industrial Park, and local residences. Eucalyptus Road is primarily used to access residential areas, adjacent industrial areas, and the closed landfill.

Several private dirt roads are located within the site. These roads are located on the levees that separate the various salt ponds and were constructed as maintenance roads for the Napa Plant Site.

4.13.2.2 Navigation (Recreation and Industrial)

The Napa River provides water access to the site, connecting the site to San Pablo Bay in the south and Napa in the north. The Napa River navigation channel is approximately 1,000 feet wide and currently maintained at an approximate elevation of -15 feet MLLW. The Napa River supports navigation of pleasure craft, tugboats, and barges. The Napa County General Plan encourages the use of the Napa River and its tributaries for industry and recreation.

4.13.2.3 Railroad

As shown on Figure 1-1, the Northwestern Pacific Railroad line bisects the northern portion of the proposed project site, with Ponds 9 and 10 to the north of the railroad line and the rest of the site to the south. At this location, the railroad line runs adjacent to Green Island Road. SMART owns this railroad line. This segment of railroad line has not been used for several years because the previous freight operator went out of business; however, SMART expects that a new freight operator will take over operation of the subject line (SMART 2005).

4.13.3 Impacts and Mitigation Measures

4.13.3.1 Standards of Significance

The proposed project would have a significant impact on transportation and traffic if it would:

- Substantially increase traffic or navigation hazards because of a design feature
- Result in inadequate emergency access, or
- Result in inadequate parking capacity

4.13.3.2 Impacts and Mitigation Measure

Emergency access to the site would remain unchanged. Therefore, this issue is not discussed any further in this section.

PROPOSED PROJECT – TIDAL RESTORATION AND MANAGED POND

TR-1: Vehicle transportation impact	Construction and operation of the proposed project would increase the number of vehicle trips at the proposed project site.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: It is anticipated that construction of the proposed project would take two 4 to 5 month construction seasons. During this time period, an average of 10 to 15 construction worker vehicles would be accessing the site of the proposed project. During peak construction periods 25 to 30 vehicles could be accessing the site.

Construction workers and trucks would use SR 29 to access the proposed project site via Green Island Road. This temporary increase in vehicle trips from construction crews and trucks would

result in minimal increases in traffic. During peak construction periods, construction-related traffic would increase peak hour traffic on SR 29 by approximately 0.8 percent. This increase would not alter the level of service of this highway. Green Island Road is very lightly traveled and could easily accommodate this slight increase in traffic.

Maintenance activities for the proposed project, such as inspection and repair of levees and trash collection, is expected to generate on average approximately 3 to 4 truck trips per week. This traffic is insignificant. Visitor traffic is expected to be 30 to 40 visitors per day during the week and 75 to 100 per day on the weekends. Most visitor traffic likely would not occur during peak hour periods. This minor increase in traffic to and from the proposed project site mostly during nonpeak hours would not cause a significant traffic impact.

TR-2: Watercraft transportation impact	Construction and operation of the proposed project would increase the number of watercraft trips in the area of the proposed project.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: It is possible that some material may be barged to the site during construction. Barge activity already exists at the proposed project site with the salt operations. Barge activity, if any, during construction would likely be less than under existing conditions. This barge activity would not substantially increase navigation hazards.

After construction, the proposed project site would contain a launching area for hand launching of nonmotorized water craft (e.g., canoes and kayaks). Kayaks and canoes generally stay close to shore and would not likely often venture into the main shipping channel of the Napa River and would not substantially increase navigation hazards.

TR-3: Vehicle parking impact	Implementation of the proposed project would require additional parking.
Significance:	Less than significant
Mitigation:	No mitigation required

Impact Analysis Discussion: Most activities are planned to take place from the larger staging and boat dock area. The parking lot should accommodate 45 to 50 car and boat trailer spaces. As stated above, it is anticipated that the proposed project site would receive 30 to 40 visitors per day during the week and 75 to 100 per day on the weekends. Use throughout the year will vary depending on hunting, angling and bird watching seasons, tidal influences, and weather conditions. The proposed parking lot is more than adequately sized to accommodate anticipated visitor parking.

ALTERNATIVE 1 – FULL TIDAL RESTORATION

Transportation impacts for Alternative 1 are equivalent to the proposed project. No mitigation measures are required.

ALTERNATIVE 2 – TIDAL RESTORATION, MANAGED POND AND PLAYA

Transportation impacts for Alternative 2 are equivalent to the proposed project. No mitigation measures are required.

ALTERNATIVE 3 – NO PROJECT

Under the No Project Alternative, no construction activities or visitor use would occur so traffic generated by those activities under the proposed project would not occur under the No Project Alternative. Some minor periodic maintenance activities could be associated with the levees but overall traffic would decrease compared with existing conditions. Visitor parking would not be needed.

5.0 OTHER CEQA CONSIDERATIONS

5.1 INTRODUCTION

CEQA requires the analysis of cumulative impacts, irreversible and irretrievable commitments of resources, the relationship between short-term uses of the environment and the maintenance and enhancement of long-term environmental productivity, and growth-inducing effects. CEQA also requires that the environmentally superior alternative be identified.

5.2 CUMULATIVE IMPACTS

Cumulative impacts are effects that produce a change in the environment that results from the incremental effect of a project when added to other closely related past, present, or reasonably foreseeable, probable future projects.

The State CEQA Guidelines require that the cumulative impacts of a proposed project be addressed when the cumulative impacts are expected to be significant (14 CCR 1530[a]).

5.2.1 Methodology and Significance Criteria

The project-specific effects of the proposed project options were evaluated to assess the potential cumulative effects. Only those effects that were identified as permanent effects and that have the potential to be additive to the effects of other projects in the region are analyzed. The analysis focuses on the following resource categories:

- Hydrology;
- Land Use and Planning;
- Public Health and Safety;
- Water Quality.

Effects on the following resource categories were found not to have the potential to contribute to cumulative impacts because the effects were extremely minor, were temporary, or had no potential to be additive and therefore contribute to cumulative impacts:

- Air Quality;
- Biological Resources; [1]
- Cultural Resources;
- Geology and Soils;
- Hazards and Hazardous Materials;
- Noise;
- Public Services and Utilities;

[1] The Project has significant and cumulative **beneficial effects** to biological resources that are not discussed herein pursuant to the CEQA definition of significant impacts.

- Public Access, Recreation and Visual Resources;
- Transportation and Traffic.

The methodology used to analyze the cumulative impacts associated with the key resource topics included:

- Developing a list of past, present, and reasonably foreseeable future projects in the vicinity of the proposed project area;
- Reviewing concerns recently expressed by a scientific panel about the cumulative impacts of area restoration and mitigation efforts;
- Reviewing the local general plans;
- Qualitatively evaluating the cumulative impacts of past, present, and future projects.

The proposed project would have a significant cumulative impact if it, in conjunction with other projects, would exceed the significance criteria established for a resource topic.

5.2.2 Projects Addressed in the Cumulative Impact Analysis

Projects considered during the cumulative impact analysis are listed in Table 1.

Table 5.1-1
Ongoing, Completed and Potentially Upcoming Projects in the Vicinity of the Proposed Project

Ongoing/Completed	Potentially Upcoming Projects
American Canyon Wetland Restoration Project • 950 acres • Completed 1998, expanded 2005	Fagan Slough Restoration Project
Highway 37 Mitigation Project/Guadalcanal Village • Approximately 50 acres • Open to tidal action • Currently maintained by CalTrans	Cullinan Ranch Restoration Project • 1493 acre seasonal wetland • Future tidal restoration project
Napa Sonoma Marsh Restoration Project • Pond 2A, 561 acres, open to tidal action • Pond 3, initially opened to tidal action 2002	Mare Island Dredge Ponds Restoration/Recreation • Navy facility slated for handover to the City of Vallejo • Activities present include dredge rehandling and discharge • All discharge regulated by regional water quality board
	Napa River Channel Dredging • Phased implementation between 2006-2008 • Part of Napa County Flood Control District's Napa River Flood Management Plan

Table 5.1-1
Ongoing, Completed and Potentially Upcoming Projects in the Vicinity of the Proposed Project

Ongoing/Completed	Potentially Upcoming Projects
Slaughterhouse Slough Restoration Project • 275 acres • Naturally restored Open to tidal action	Napa Sonoma Marsh Restoration Project - Ponds 4 and 5 • Construction late 2005-06 by DFG • 1631 acres (pond 4: 960 ac, pond 5: 771 ac)
Tolay Creek Restoration Project • 376 acres • DFG • Open to tidal action, 1997	Skaggs Island Restoration Project • 3310 acre seasonal wetland and upland • Navy owned. Former military installation abandoned in early 1990s. Built on a former tidal wetland, about 200 structures must be demolished before restoration of wetlands can proceed • Project to begin by 2010
Vallejo Marina Dredging • Allows Vallejo Yacht Club to dredge site in Mare Island Strait • Dredged materials disposed of at USACE Carquinez Landfill.	Vallejo River Park Master Plan • Long range plan to remove accumulated dredged material and convert to 39 acres to tidal wetland • Currently disconnected from Napa River

The proposed NPSR project would result in a substantial long-term benefit to endangered species and aquatic resources by creating a substantial amount of new subtidal habitat and eventually marsh habitat. However, there is the potential for several significant cumulative impacts associated with the proposed project. The following sections provide an analysis of the cumulative effects of the proposed project.

5.2.3 Cumulative Impact Analysis

5.2.3.1 Hydrology

Impact Cu-1: Cumulative Hydrologic Changes in the Lower Napa River

Implementation of the proposed project in conjunction with other projects would result in potential hydrologic effects on the lower Napa River. Preliminary project modeling, which included the proposed project and models adapted from the NSMRP project, indicates that localized hydrologic changes would occur in tidal sloughs and in the Napa River.

Tidal wetlands restoration projects in the lower Napa River (Table 5.1-1) would cumulatively cause a substantial increase in the tidal prism and would likely cause rapid scour of the tidal sloughs and adjoining fringe marshes, resulting in sediment suspension and redistribution throughout the Napa River and into San Pablo Bay. This suspension and redistribution of sediment could result in beneficial effects, such as a reduction in the amount of dredging needed in the Napa River and the Vallejo Marina. It could also result in adverse effects, such as a

slowing of sediment accretion necessary to foster evolution of emergent tidal marsh in current restoration efforts along the lower Napa River (CSCC and CDFG 2004). It could also be postulated that slower evolution of emergent tidal marsh is not a negative affect because the open water and intertidal habitat would be used by a different complement of species.

Until the tidal sloughs are enlarged enough to convey the full tidal prism, the tidal range will be muted (PWA et al. 2002). Muted tides may slow the accretion of sediments in the restoration areas; slow the evolution of higher marsh habitats in the restoration areas; and modify the hydrologic regime of existing marshlands within the slough network, potentially causing a vegetation type shift. This vegetation type shift is not expected to be adverse because it represents the natural movement and evolution of habitats.

The increased tidal prism would also increase the maximum velocities through the Mare Island Strait and the lower Napa River. Although increased channel velocities may aid in long-term channel maintenance by reducing the need for dredging, the increased velocities may pose a hazard to maritime traffic.

Some uncertainty remains regarding the sediment redistribution effects of the proposed project in the lower Napa River, and this redistribution has the potential to cause substantial adverse effects throughout the area.

Mitigation Measure Cu-1: Implement Monitoring and Adaptive Management Program.

The NSMRP sponsors have prepared a program to monitor and evaluate natural resource changes throughout the NSMRP project area and in the lower Napa River, as well as an adaptive management program to rectify, avoid, or minimize the long-term adverse effects of the project. The monitoring program has identified and established ongoing data collection stations throughout the Napa River Unit, including the lower Napa River. The project sponsors (DFG) monitor key parameters including erosion, water quality, vegetation, wildlife, and fish. The results from this data collection effort are shared with regional natural resource managers from USFWS, DFG, and the San Francisco Estuary Institute, who evaluate habitat conditions as a whole. The project sponsors set performance criteria for each of these parameters; if the performance criteria are not achieved, the adaptive management program would be implemented. The adaptive management program identifies supplemental management techniques to be implemented for each resource parameter. Mitigation Measure Cu-1 consists of coordinating with the sponsors of the NSMRP project to ensure that the proposed project becomes an active player in this regional monitoring system through adherence to the performance criteria outlined above.

Implementation of Mitigation Measure Cu-1 would reduce this impact to a less-than-significant level.

5.2.3.2 Land Use and Planning

Impact Cu-2: Conflict with the Napa County Zoning Ordinance.

The proposed project would create habitat that may attract birds in ALCUP Zones B, C, and D of the Napa County Airport. Implementation of the NSMRP may also attract birds in ALUCP Zones C, D, and E of the Napa County Airport. As described in Section 4.8, land uses that have

the propensity to attract birds are not normally acceptable land uses in ALUCP Zones C and D because of safety concerns. Cumulatively, the addition of habitat under the NSMRP that would attract birds within ALUCP Zones C and D would incrementally increase the effect of the proposed project in its conflict with the Napa County Zoning Ordinance for airport compatibility. This would be a significant cumulative impact.

Mitigation Measures PHS-PP-1a through 1d partially reduces the effect of this impact.

Since the severity of this impact is mainly due to the proposed project, no additional mitigation measures would be feasible to reduce this cumulative effect.

5.2.3.3 Public Health and Safety

Impact Cu-3: Safety hazards for operations of aircraft using the Napa County Airport.

Part of the eastern portion of the NSMRP is within a 10,000-foot radius buffer of the Napa County Airport. As described in Section 4.11, the FAA discourages locating hazardous wildlife attractants within this buffer area for airports serving turbine-powered aircrafts. The entire proposed project area is within this 10,000-foot buffer. The NSMRP and the proposed project would create habitat that would attract birds. Cumulatively, the addition of this habitat under the NSMRP within this buffer would incrementally increase the adverse effect of the proposed project to public health and safety.

Mitigation Measures PHS-PP-1a through 1d partially reduces the effect of this impact.

Since the severity of this impact is mainly due to the proposed project, no additional mitigation measures would be feasible to reduce this cumulative effect.

5.2.3.4 Water Quality

Impact Cu-4: Cumulative Adverse Change in Water Quality

The flushing of salt and physical and chemical constituents from the salt ponds and other regional projects, including the use of recycled water, into the Napa River could temporarily degrade water quality in the lower Napa River and sloughs.

Ongoing issues of concern from the point-source and nonpoint-source discharges include adverse changes in the concentrations of pH, temperature, TSS, DO, oxygen-demanding substances [BOD], biostimulatory nutrients (nitrogen and phosphorus), and toxics. Resources that might be adversely affected include fish habitat and habitat for other marine and estuarine aquatic organisms. Some of the contaminants present in the ponds are potentially harmful to aquatic wildlife if the concentration and duration of exposure is sufficiently elevated. BOD may increase and DO may be sufficiently suppressed to cause short-term habitat impairment. Specific fate and transport modeling of these constituents during salinity reduction operations has not been conducted. Therefore, careful management of the salinity reduction operations should result in small increases in receiving water concentrations of other constituents.

In the future, allowable numeric and narrative water quality objectives will most likely become more restrictive as water quality regulatory programs are implemented. For example, TMDL

programs for 303(d) listed constituents in Bay Area waters and associated implementation plans will be completed by the San Francisco Bay RWQCB in the next several years. The TMDL implementation plans will contain new restrictions on the allowable mass loading of contaminants from various discharge sources in the watersheds. The specific requirements of these programs and ramifications of the discharges affecting the lower Napa River and northern San Pablo Bay are currently speculative. However, in general these future regulatory programs should improve background water quality conditions and reduce exposure of the restored ponds to water quality impacts from other discharges of toxic and conventional constituents. In addition, background concentrations of the most toxic constituents, such as mercury, organochlorine pesticides, and PCBs are expected to decline gradually over time in the next 20 to 50 years because their use has been either discontinued or greatly reduced.

Cumulative restoration efforts for tidal wetland areas throughout the North Bay have the potential to provide net environmental benefits. Wetlands are generally acknowledged to provide favorable water quality improvement mechanisms such as filtration, settling, photodegradation, adsorption, and enhanced biological activity (uptake, chemical transformation, degradation).

However, if proposed project operations are not controlled, adverse cumulative water quality impacts could potentially occur in receiving waters. Therefore, this impact is considered significant. Implementation of Mitigation Measure WQ-2, "Design Proposed Project in Compliance with Resource Agency Permit Conditions and Conduct Water Quality Monitoring" (see Chapter 4.7, "Water and Sediment Quality"), and Mitigation Measure Cu-1, "Implement Monitoring and Adaptive Management Program" (see Section 4.6, "Water Resources/Hydrology") would reduce this impact to a less-than-significant level.

5.2.3.5 Biology

Impact Cu-5: Impacts to water bird habitat as a result of converting salt ponds to tidal wetland

The proposed project would convert over 1,000 acres of salt ponds to tidal habitat. Restoration projects in the lower Napa River (Table 5.1-1) would cumulatively result in conversion of several thousand acres of open water to tidal habitats. The loss of open water habitat could adversely affect water birds (e.g., waterfowl and shorebirds) by reducing available foraging and roosting habitat. To offset the potential adverse impacts associated with conversion of salt ponds to tidal wetland the Goals Project (1999) recommends maintaining large areas as salt ponds or shallow open water habitat in the Napa River area.

Constructing the managed pond as part of the proposed project reduces the effect of this impact to less than significant.

While many salt ponds provide valuable water bird habitat, ponds in the project area have low bird diversity and abundance because the high salinity ponds lack significant prey resources. The managed pond would provide higher quality habitat for water birds than the existing salt ponds. Following implementation of the proposed project diversity and abundance of waterfowl and shorebirds in the project area would likely be greater than the existing condition. In addition to the managed pond in the project area, the NSMRP will manage several thousand acres of former salt ponds to provide habitat for migratory and resident water birds in the Napa River area.

5.3 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

An EIR is required to identify the environmentally superior alternative—that is, the alternative having the potential for the fewest significant environmental impacts—from among the range of reasonable alternatives that are evaluated. Table 5.3-1 summarizes the impacts of the project alternatives.

The **proposed project** would result in significant unavoidable impacts in the areas of land use conflicts, and public health and safety regarding potential bird strike aircraft hazards.

Alternative 1, Full Tidal Restoration, would reduce the impacts associated with land use conflicts and bird strike aircraft hazards compared with the proposed project. However, these impacts would still be significant and unavoidable. Alternative 1 would also reduce anadromous fish impacts, long-term salinity impacts, and impacts to general water quality parameters. Alternative 1 has the least habitat diversity, but would create more tidal habitat for wildlife, fish, and sensitive natural communities than the proposed project. However, compared to the proposed project, Alternative 1 would increase the area with potential for mercury methylation. In addition, disease vector impacts would be increased because tidal areas provide potential mosquito breeding habitat.

Alternative 2, Tidal Restoration, Managed Ponds and Playa, would not reduce any of the significant and unavoidable impacts associated with the proposed project. Compared with the proposed project Alternative 2 would reduce impacts associated with hazardous materials, salinity, mercury, and creation of mosquito habitat. Alternative 2 would also increase habitat diversity compared with the proposed project.

Alternative 3, No Project, would reduce the significant and unavoidable impacts associated with the proposed project with regards to land use conflict and bird strike aircraft hazards but only during the dry season. During the wet season these impacts would be greater than the proposed project. None of the construction-related impacts to biological resources and hazardous materials associated with the proposed project would occur with Alternative 3. Impacts to water quality would also be less under Alternative 3.

The **Environmentally Superior Alternative** would be Alternative 3, No Project because it would have the fewest significant impacts. Of the "build" alternatives Alternative 1 would be the environmentally superior alternative because it would have fewer significant impacts than the proposed project or Alternative 2 and would reduce two of the significant and unavoidable adverse impacts.

While Alternative 1 would be the Environmentally Superior Alternative, DFG believes that the proposed project, by including the managed pond, would provide the greatest benefit to the diverse range of species that utilize the Napa-Sonoma Marshes ecosystem. The managed pond has been situated in an area that would minimize potential conflicts with adjacent land use (i.e., airport activities) and its proximity to the Napa River will allow water quality conditions to be controlled in a cost-effective, environmentally-sound manner. Although there are some potential environmental drawbacks associated with operation of the managed pond, the benefits of incorporating a large open-water area into the project landscape justify the impacts.

As the Bay-wide effort to restore salt ponds to tidal marsh intensifies the importance of maintaining open water areas that benefit water birds is increasingly important. Historically, waterfowl and shorebirds were dependent on the seasonal ponds that formed on the margins of

the Bay. Since most of these areas have been developed for agriculture, commercial and residential uses salt ponds have become increasingly important habitat for migratory birds using the Pacific Flyway. The managed pond component of the proposed project would contribute to sustaining open-water habitat in the North Bay and mitigate the loss of ecological function historically provided by salt ponds in the region.

Furthermore, DFG recognizes the proposed project as a significant opportunity to broaden public outreach and environmental education in the North Bay region. Habitat diversity provided by the managed pond is an important component of the educational opportunities envisioned for the project site. For example, docent-lead tours of the project site could educate the public on the value of habitat and species diversity. People would have the opportunity to view a mosaic of wetland habitats in a safe, easily accessible location. Therefore, DFG believes that potential environmental impacts associated with the proposed project are outweighed by the ecological and social benefits it would afford.

Table 5.3-1
SUMMARY OF IMPACTS BY PROJECT ALTERNATIVE

KEY - IMPACTS	
Significant	◆
Potentially Significant	◆
Less Than Significant	◆
No Impact	◆

RESOURCE AREA	IMPACT	PROPOSED PROJECT	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	RESIDUAL SIGNIFICANCE
AIR QUALITY						
Construction Activities	AQ-1	◆	◆	◆	◆	◆
Increased Emissions	AQ-2	◆	◆	◆	◆	◆
BIOLOGY						
Special Status Plant Species	BIO-1a	◆	◆	◆	◆	◆
Special Status Wildlife Species	BIO-1b	◆	◆	◆	◆	◆
Special Status Aquatic Species	BIO-1c	◆	◆	◆	◆	◆
Sensitive Natural Communities	BIO-2	◆	◆	◆	◆	◆
Wetland Habitat	BIO-3	◆	◆	◆	◆	◆
Anadromous Fish Passage	BIO-4	◆	◆	◆	◆	◆
CULTURAL RESOURCES						
Levee Breach Construction	CR-1	◆	◆	◆	◆	◆

RESOURCE AREA	PROJECT	PROPOSED PROJECT	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	RESIDUAL SIGNIFICANCE
GEOLOGY						
Seismic Surface Rupture	GEO-1	◆	◆	◆	◆	◆
Seismic Shaking	GEO-2	◆	◆	◆	◆	◆
Raising Existing Levees	GEO-3	◆	◆	◆	◆	◆
Expansive Soils	GEO-4	◆	◆	◆	◆	◆
Tsunami	GEO-5	◆	◆	◆	◆	◆
Soil Exposure	GEO-6	◆	◆	◆	◆	◆
Shallow Groundwater	GEO-7	◆	◆	◆	◆	◆
HAZARDOUS MATERIALS						
Transport	HAZ-1	◆	◆	◆	◆	◆
Exposure	HAZ-2	◆	◆	◆	◆	◆
Excavation	HAZ-3	◆	◆	◆	◆	◆
Construction	HAZ-4	◆	◆	◆	◆	◆
HYDROLOGY AND WATER RESOURCES						
Existing Flow Patterns	WR/HY-1	◆	◆	◆	◆	◆
Flooding Risk	WR/HY-2	◆	◆	◆	◆	◆
WATER AND SEDIMENTATION						
Stormwater	WA-SED-1	◆	◆	◆	◆	◆
Salinity	WA-SED-2	◆	◆	◆	◆	◆

RESOURCE AREA	PROJECT	PROPOSED PROJECT	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	RESIDUAL SIGNIFICANCE
WATER AND SEDIMENTATION (CONT.)						
Water Quality	WA-SED-3					
Pollution	WA-SED -4					
Mercury	WA-SED -5					
Methyl Mercury	WA-SED -6					
LAND USE, PLANNING & COMMUNITY ISSUES						
Agricultural Resources	LU-1					
Applicable Land Use Plans and Policies	LU-2					
NOISE						
Construction Activities	N-1					
PUBLIC SERVICES & UTILITIES						
Water Pipeline Construction	PSU-1					
Mosquito Abatement	PSU-2					
PUBLIC HEALTH AND SAFETY						
Airport Land Use	PHS-1					
Disease Vectors	PHS-2					
PUBLIC ACCESS, RECREATION AND VISUAL EFFECTS						
Construction of Recreation Facilities	PARV-1					

RESOURCE AREA	PROJECT	PROPOSED PROJECT	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	RESIDUAL SIGNIFICANCE
PUBLIC ACCESS, RECREATION AND VISUAL EFFECTS (CONT.)						
Nighttime Light	PARV-2	◆	◆	◆	◆	◆
TRANSPORTATION						
Increased Vehicle Trips	TR-1	◆	◆	◆	◆	◆
Increased Watercraft Trips	TR-2	◆	◆	◆	◆	◆
Additional Parking	TR-3	◆	◆	◆	◆	◆

5.4 OTHER REQUIRED ANALYSES

5.4.1 Significant Environmental Effects of the Proposed Project

Potentially significant environmental effects of the proposed project have been identified for air quality, biology, hazardous materials, hydrology and water resources, water and sediment quality, public services and utilities, public health and safety and visual resources. These impacts are discussed in Section 4.1 through 4.12 of this EIR. Mitigation has been recommended that can reduce these impacts to less than significant.

5.4.2 Significant Environmental Effects Which Cannot be Avoided if the Proposed Project is Implemented

Significant and unavoidable impacts have been identified for the proposed project in land use and public health and safety. The proposed project includes development of a managed pond in the South Unit that would contain open water. This portion of the proposed project site would, therefore, continue to attract waterfowl and shorebirds, and it is considered likely that the number/density of birds in this area would increase as a result of the proposed project. This area lies within ALUCP Zone D where land uses that have the propensity to attract birds are considered normally not acceptable. Therefore, this use could conflict with the Napa County Zoning Ordinance for airport compatibility. The proposed project would be located in an airport land use planning area and could result in a safety hazard for operations of aircraft using the airport. These impacts are discussed further in Section 4.8 and 4.11 of this EIR.

5.4.3 Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the environment that would occur with restoration include the impacts on existing wetlands and habitat and those from construction-related activities. However, in the long term, the site is expected to be substantially more productive for habitat and wildlife values.

5.4.4 Significant Irreversible Environmental Changes Which Would be Caused by the Proposed Project Should it be Implemented

The proposed project would result in the irretrievable commitment of fossil fuels and other energy sources to build, operate, and maintain the wetlands. The restoration of the site to wetlands, however, is not considered an irreversible commitment because the landscape could be converted to other land uses in the future.

5.4.5 Growth-Inducing Impact of the Proposed Project

Section 15126(d) of the CEQA Guidelines require that growth inducing effects of a proposed project be addressed in an EIR. The CEQA Guidelines state the following:

Discuss ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects that would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may further tax existing community service facilities so consideration must be given to this impact. Also discuss the characteristics of some projects, which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project EIR need not evaluate general growth within a community if that growth is not caused, in part, by the project being evaluated.

The analysis presented in this section discusses these factors.

The proposed Napa Plant Site Restoration project would not induce growth in the region of the proposed project. One component of the proposed project could potentially remove an obstacle to growth. A new water supply pipeline would be constructed along Green Island Road from where the line presently terminates (approximately 1,000 feet east of the proposed project site) another 3,000 + feet along the eastern boundary of the site and then into the site. Development within this area would be restricted on the west by the proposed project and on the southern portion of the east side by County-owned land that is designated as an airport buffer zone. In the northern portion of the east side there are several industrial wrecking yards. This area is zoned Industrial. This area is also located within Airport Land Use Compatibility Plan (ALUCP) zones B and D of the Napa County Airport. Development is restricted within Zone B to low intensity uses due to substantial risk from low flying aircraft. Most non-residential development is allowed in Zone D.

Since the only property that could conceivably be further developed that is adjacent to the proposed water supply pipeline is already in use it would be speculative to assume that this property would be developed for another, more intensive land use. Therefore, it would be speculative to assume that the proposed project would be growth inducing.

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