Otay River Estuary Restoration Project
Final Environmental Impact Statement
San Diego Bay National Wildlife Refuge




LEAD AGENCY:

U.S. Fish and Wildlife Service
San Diego National Wildlife Refuge Complex
1080 Gunpowder Point Drive
Chula Vista, CA 91910

FEBRUARY
2018

COOPERATING AGENCY:

Army Corps of Engineers
Los Angeles District
5900 La Place Ct., Suite 100
Carlsbad, CA 92008-8832

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Final Environmental Impact Statement

Lead Agency:

U.S. Fish and Wildlife Service
San Diego National Wildlife Refuge Complex
P.O. Box 2358
Chula Vista, California 91912

Cooperating Agency:

U.S. Army Corps of Engineers

Prepared By:

DUDEK

605 Third Street

Encinitas, California 92024

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Final Environmental Impact Statement
San Diego Bay National Wildlife Refuge
San Diego County, California

Lead Agency: U.S. Department of the Interior, Fish and Wildlife Service

Cooperating Agency: U.S. Army Corps of Engineers

For Further Information: Brian Collins, Refuge Manager
San Diego NWR Complex
P.O. Box 2358, Chula Vista, CA 91912
(619) 575-2704 extension 302

Abstract: The U.S. Fish and Wildlife Service (Service) proposes to restore approximately 125 acres of coastal wetlands and associated uplands at two locations on the San Diego Bay National Wildlife Refuge (NWR or Refuge), San Diego County, California. The proposed action, which would implement restoration proposals included in the San Diego Bay NWR Comprehensive Conservation Plan, would involve restoring tidal influence to a 33.5-acre portion of the Otay River floodplain and a 91-acre active solar salt pond (Pond 15). The final environmental impact statement (FEIS) analyzes the potential environmental effects of implementing the no action alternative and two actions alternatives (one focused on intertidal restoration and one focused on subtidal restoration). The intertidal alternative is the preferred alternative. A Record of Decision (ROD) identifying the Service's decision on which alternative to implement is anticipated in April 2018.

For more information, visit the San Diego Bay NWR webpage at:
https://www.fws.gov/refuge/San_Diego_Bay/what_we_do/Resource_Management/Otay_Restoration/Otay_River_Estuary_Restoration_Project.html

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
μg/kg	micrograms per kilogram
°F	degrees Fahrenheit
°C	degrees Celsius
ADT	average daily traffic
APE	area of potential effects
Basin Plan	Water Quality Control Plan for the San Diego Basin
BMP	best management practice
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CAP	Contaminants Assessment Process
CARB	California Air Resources Board
CCP	Comprehensive Conservation Plan
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
cm	centimeters
Commission	California Coastal Commission
CO	carbon monoxide
CO_2	carbon dioxide
CO_2E	carbon dioxide equivalent
Corps	U.S. Army Corps of Engineers
CRAM	California Rapid Assessment Method
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DDT	dichlorodiphenyltrichloroethane
DO	dissolved oxygen
DPS	Distinct Population Segment
dw	dry weight
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERL	effects range low
ERM	effects range median
ERC	Exposure Reduction Cover
FEMA	Federal Emergency Management Agency
FRP	Final Restoration Plan

Acronym/Abbreviation	Definition
ft/s	feet per second
G	acceleration due to gravity
GHG	greenhouse gas
GWP	global warming potential
H_2O	water (vapor)
HALS	Historic American Landscape Survey
I-5	Interstate 5
INRMP	Integrated Natural Resources Management Plan
kV	kilovolt
LOS	level of service
ORERP	Otay River Estuary Restoration Project
m/sec	meters per second
mg/L	milligrams per liter
MHPA	Multi-Habitat Planning Area
MLLW	mean lower low water
MLMP	Marine Life Mitigation Plan
MM	Mitigation Measure
mm/year	millimeters per year
MMT CO_2E	million metric tons carbon dioxide equivalent
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSCP	Multiple Species Conservation Program
MT	metric ton
MTS	Metropolitan Transit System
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NF_3	nitrogen trifluoride
NHPA	National Historic Preservation Act
NMFS	DO NOT USE - see NOAA Fisheries
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
O_3	ozone
ORERP	Otay River Estuary Restoration Project
OVRP	Otay Valley Regional Park
PAH	polycyclic aromatic hydrocarbons

Acronym/Abbreviation	Definition
PCB	polychlorinated biphenyls
PL	Public Law
PM_{10}	coarse particulate matter
$PM_{2.5}$	fine particulate matter
PMP	Port Master Plan
Poseidon	Poseidon Resources (Channelside) LP
Port	San Diego Unified Port District
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
RAQS	Regional Air Quality Strategy
Regional Board	San Diego Regional Water Quality Control Board

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This environmental impact statement (EIS) has been prepared by the U.S. Fish and Wildlife Service (USFWS or Service) in cooperation with the U.S. Army Corps of Engineers. It outlines the potential environmental impacts associated with implementation of the Otay River Estuary Restoration Project (ORERP or project), proposed by the Service in partnership with Poseidon Resources (Channelside) LP (Poseidon). The ORERP would implement the habitat restoration objectives of the *San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan* (CCP; USFWS 2006), and fulfills the applicable terms and conditions of the permits issued to Poseidon by the California Coastal Commission and San Diego Regional Water Quality Control Board for the Carlsbad Desalination Project.

This EIS was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.), and in conformance with the Council on Environmental Quality's NEPA guidelines. The Service is the Federal lead agency under NEPA. The U.S. Army Corps of Engineers, based on its jurisdiction by law and special expertise pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403), has agreed to cooperate and participate as a cooperating agency, pursuant to Title 40 of the Code of Federal Regulations, Section 1501.6, on the development of the ORERP EIS.

Although compliance with CEQA is not required to implement projects proposed within the boundaries of the San Diego Bay NWR, implementation of the ORERP requires approvals, permits, and/or certifications from several state agencies (e.g., California Coastal Commission, San Diego Regional Water Quality Control Board) and the Port of San Diego, which are subject to CEQA compliance. As such, this EIS was prepared to aid these state and local agencies in making appropriate CEQA findings. Pursuant to Section 15221 of the CEQA Guidelines, which sets forth rules governing use of a NEPA document to satisfy CEQA, this EIS includes a discussion of mitigation measures and an analysis of the potential for growth-inducing impacts associated with implementation of the proposed action. Sections 4.1 through 4.6 of this EIS include an impact analysis and a discussion of mitigation measures that would be implemented to reduce impacts to below a level of significance. Section 6.2 of this EIS includes a discussion of both action alternatives' potential impacts associated with growth inducement, hazards, and energy. State and local agencies interested in using this EIS to satisfy their CEQA requirements have and continue to work closely with the Service in completing the NEPA review for the ORERP to ensure that the discussions included in this document meet the requirements of CEQA.

This EIS analyzes the project-specific environmental impacts of the ORERP and a reasonable range of alternatives. The analysis is intended to tier from the programmatic EIS and Record of Decision for the San Diego Bay NWR CCP (USFWS 2006; 71 FR 64552–64553) that evaluated project alternatives to restore the Otay River floodplain and salt ponds. The Final EIS for the San Diego Bay NWR CCP is incorporated by reference into this document.

ES.2 PROJECT DESCRIPTION

The ORERP is a partnership between the Service and Poseidon to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species, and to provide habitat for migratory seabirds and shorebirds and salt-marsh-dependent species in the South San Diego Bay Unit of the San Diego Bay NWR.

The ORERP site is located at the south end of San Diego Bay, San Diego County, California, within the boundaries of the South San Diego Bay Unit of the San Diego Bay NWR, and is composed of two separate sites: the Otay River Floodplain Site and the Pond 15 Site (see Figure 1-1, Regional Map). The first site is a 33.51-acre area of primarily disturbed uplands on the Otay River floodplain (hereafter referred to as the Otay River Floodplain Site). The Otay River Floodplain Site would be restored to estuarine, intertidal, and upland habitats. The second site, a 90.90-acre active solar salt pond (hereafter referred to as the Pond 15 Site) would be restored to subtidal and intertidal habitats.

Following consideration of the comments provided during the public review period for the Draft EIS and further review of the restoration proposals (Alternatives B and C) several modifications to the original action alternatives have been made. These include the elimination of the proposal to stockpile material on the Otay River floodplain in an area east of Nestor Creek and instead use the up to 36,000 cubic yards of excess material from the excavation of the Otay River Floodplain Site to create an Exposure Reduction Cover (ERC) over an area east of Nestor Creek that contains elevated levels of contaminants, primarily DDT. The ERC, which would be between 1 foot to 1.5 feet in thickness and approximately 23 acres in area, would be revegetated with appropriate native upland vegetation. In addition, the option of transporting excavated material as a slurry through a pipeline to the Pond 15 Site has been eliminated. Excavated material from the Otay River Floodplain Site would be transported either via a conveyor belt or trucks.

ES.3 ENVIRONMENTALLY PREFERABLE AND AGENCY PREFERRED ALTERNATIVE

The Draft and Final EIS identifies three alternatives for the implementation of the ORERP. The three alternatives include the no action alternative (Alternative A) and two action alternatives, an Intertidal Alternative (Alternative B) and a Subtidal Alternative (Alternative C). Additional alternatives were considered but eliminated from further analysis in this EIS, as described in detail in Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis.

The Service has identified Alternative B as the environmentally preferable alternative. Specific differences between the three alternatives evaluated in this document are outlined in Section 2.3.5, Comparison of Alternatives. Although Alternative B was modified, it continues to be the Service's preferred alternative and the environmentally preferable alternative. Modifications to Alternative B between the Draft and Final EIS are indicated in the Final EIS using a strikeout/underline format.

~~Although Alternative B has been identified as the preferred alternative, the alternative ultimately selected for implementation may include any one of the three alternatives presented in this document or could include a combination of actions from the range of alternatives described. Such modifications may occur in response to comments received on the Draft EIS during the public comment period.~~

ES.4 IMPACTS DETERMINED TO BE SIGNIFICANT

Table ES-1 provides a summary of the impacts and associated mitigation measures identified within this ~~Draft~~ Final EIS. Revisions (indicated by strikeout/underline) to the impacts and mitigation measures presented in the Draft EIS have been made as appropriate in response to comments received during the public comment period. Impacts associated with topography/visual quality; geology and soils; paleontological resources; hydrology and water quality; noise; biological resources; cultural resources; land use, traffic circulation, and parking; recreation; utilities; and economics/employment were identified as potentially significant; however, adequate measures have been incorporated into the scope of the project to avoid or minimize potential adverse effects.

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	Topography/Visual Quality	
The installation of the Otay channel protection project feature, including channel armoring, could adversely affect visual quality along this segment of the Bayshore Bikeway. The placement of excess material from this excavation ~~into two stockpiles~~ within the Otay River Floodplain Site could adversely affect visual quality.	**MM-VIS-1**: Should slope armoring along the Otay River channel be deemed necessary, a revegetation plan ~~for the implementation~~and accompanying monitoring plan to address the establishment of vegetative screening ~~adjacent to the Otay Channel Protection project feature (if implemented), and revegetation of on-site stockpiles~~for the affected area shall be approved by the U.S. Fish and Wildlife Service (Service) and the Executive Director of the California Coastal Commission (Commission) prior to the initiation of any grading at ~~any grading in either~~the project ~~site~~. The revegetation plan shall be prepared by a qualified restoration specialist and shall identify the proposed plantings, hydroseed mix, and applicable treatment, monitoring, and success criteria ~~for both areas~~. The revegetation plan shall include the following requirements~~ for each location~~: ~~***Otay Channel Protection vegetative screening***: ~~Following installation of the Otay Channel Protection (if required) as proposed adjacent to the Bayshore Bikeway and Pond 48 (Project Feature 2, as shown on Figure 2-1a of the EIS), low shrub vegetation shall be installed to enhance existing visual screening of the Otay channel. Vegetative screening shall be implemented on the south side of the fence line along the Bayshore Bikeway where channel armoring is visible to cyclists utilizing the Bikeway. Planting of low shrub vegetation shall only be required where existing vegetation does not adequately screen views of the proposed armoring for Otay channel protection project feature. Plant material to be installed and planting density/spacing shall be consistent with existing vegetation located on the south side of Bikeway-adjacent fencing, or as adequate to screen views of the project feature. ~~***Stockpile vegetation***: Immediately upon completion of all material transport activities from the Otay River Floodplain Site, all necessary grading and compaction of the two stockpiles shall be completed and an appropriate hydroseed mix shall be applied to the top and slopes of the stockpiles.~~ The Otay Channel Protection area ~~and stockpile revegetation efforts~~ shall be monitored and maintained during the establishment of the vegetation to control weeds and ensure that ~~both sites~~the site is ~~are~~ meeting applicable success criteria~~ identified in the revegetation plan for vegetative cover~~. If necessary to meet these success criteria, additional hydroseeding and/or plantings shall be conducted and/or adaptive management measures shall be implemented as needed until the Otay Channel Protection area vegetative screening area ~~and stockpiles are~~is	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	adequately vegetated (see Appendix D). ~~Each location~~The revegetated area shall continue to be monitored and maintained for a period of 5 years after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring. Monitoring reports shall be submitted to the Service annually to detail the progress towards achieving the required species and vegetation coverage. Once the approved success criteria have been met, a final report shall be submitted to the Service and the Commission to document completion in accordance with the approved revegetation plan.	
	Geology, Soils, and Agricultural Resources	
Adverse effects to habitat and vegetation communities and jurisdictional waters could result from erosion of soils during construction.	**MM-GEO-1**: A project-specific stormwater pollution prevention plan (SWPPP) shall be prepared and approved by the U.S. Fish and Wildlife Service (Service) and the Regional Water Quality Control Board before the start of construction. The SWPPP shall be implemented by the contractor throughout the duration of construction, including while construction activities are temporarily halted during the core nesting season. The best management practices (BMPs) contained in the SWPPP shall include, but are not limited to, silt fences, fiber rolls, gravel bags, and soil stabilization measures such as erosion control mats and hydroseeding to prevent soil erosion and sedimentation during wind and rain events. Implementation of these BMPs as delineated in the SWPPP shall apply to all areas proposed for excavation. Structural BMPs (or suites of BMPs) shall be designed to treat, infiltrate or filter the amount of stormwater runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs. The SWPPP shall also include a schedule and protocols for inspection, cleaning and repairing of BMPs. The Service is responsible for ensuring that the contractor implements and maintains the BMPs identified in the SWPPP.	Less than significant
Creation and/or modification of slopes ~~and stockpiled~~ material within the Otay River Floodplain Site could result in adverse effects related to erosion.	**MM-GEO-2**: To ensure the long-term stability of all slopes created within the project site, a post-construction erosion control plan shall be prepared by a registered professional engineer or certified hydrogeologist and approved by the Service prior to the commencement of grading. A map or graphic shall be included in the erosion control plan identifying the locations and specific erosion and sedimentation control measures to be implemented. As part of the erosion control plan, the contractor shall be required to confirm that slope gradients are constructed as designed, all post-construction erosion control measures are in place, and the slopes are planted or seeded immediately upon completion of construction activities consistent with the revegetation plan as identified in MM-VIS-1.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	Planting and/or seeding of slopes ~~and stockpiled~~ material shall be monitored and maintained during establishment of the vegetation to ensure that vegetative cover, as determined by a qualified restoration specialist, is achieved as specified in the revegetation plan identified in MM-VIS-1. ~~In addition to stockpile hydroseeding and establishment of vegetative cover, the following measures shall be implemented, as deemed necessary by a registered professional engineer or certified hydrogeologist, as part of the erosion control plan, to prevent erosion of stockpiled material:~~ • ~~Topographic controls such as contouring and terracing shall be implemented, if necessary, to limit scouring resulting from steeply sloped piles during large rain events.~~ • ~~A trench or drainage channel overlain by rock check dams shall be installed at the base of the stockpiles to divert stormflow away from adjacent wetland areas and treat stormwater runoff during large rain events.~~ • ~~Biodegradable wattles and erosion control blankets shall be installed over the stockpiles until vegetative cover is sufficiently established. Wattles and/or blankets would not need to be removed following vegetative establishment.~~ ~~The stockpiles shall continue to be monitored and physically maintained in perpetuity after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring, and that all required runoff control measures are operating effectively to the satisfaction of the registered professional engineer or certified hydrogeologist. The Service would be responsible for long-term monitoring and maintenance of the stockpiles until their eventual deconstruction.~~	
	Paleontological Resources	
Bay Point Formation is expected to be encountered subsurface; therefore, adverse effects to paleontological resources could	**MM-PALEO-1**: Prior to commencement of any grading activity on site, Poseidon shall retain a qualified paleontologist, subject to the review and approval of the Service. The qualified paleontologist shall be on site during all rough grading and other significant ground-disturbing activities in depths greater than 10 feet below ground surface.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
occur.	The paleontologist shall prepare a paleontological resources impact mitigation program for the proposed action. The program shall be consistent with the guidelines of the Society of Vertebrate Paleontologists (2010) and shall include the following: • Attendance at the pre-construction conference by a qualified paleontologist or his/her representative. • Development and implementation of a training program for project personnel. • Monitoring of excavation activities by a qualified paleontological monitor in areas identified as likely to contain paleontological resources. The monitor shall be equipped to salvage fossils and/or matrix samples as they are unearthed in order to avoid construction delays. The monitor shall be empowered to temporarily halt or divert equipment in the area of the find in in the event paleontological resources are discovered. • Because the underlying sediments may contain abundant fossil remains that can only be recovered by a screening and picking matrix, these sediments shall occasionally be spot-screened through 1/8- to 1/20-inch mesh screens to determine whether microfossils exist. If microfossils are encountered, additional sediment samples (up to 6,000 pounds) shall be collected and processed. • Preparation of recovered specimens to a point of identification and permanent preservation. This includes the washing and picking of mass samples to recover small invertebrate and vertebrate fossils and the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost for the developer. • Identification and curation of specimens into a museum repository with permanent retrievable storage. • Preparation of a report of findings with an appended itemized inventory of specimens. When submitted to the Service, the report and inventory would signify completion of the program to mitigate impacts to paleontological resources.	

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	Hydrology and Water Quality	
Sediment moving from Pond 15 into San Diego Bay during and immediately following levee breaching could result in adverse effects to water quality in the immediate vicinity of the project site.	**MM-HYD-1** Just prior to breaching Pond 15, the U.S. Fish and Wildlife Service (Service) shall ensure that the turbidity level measured in Pond 15 does not exceed 20 percent of the turbidity level measured in the area of the Bay located adjacent to Pond 15. If the turbidity level in Pond 15 is found to exceed the 20 percent threshold, breaching shall be delayed until the turbidity level in Pond 15 is consistent with the 20 percent threshold. In addition, the breaching of Pond 15 shall be scheduled to start during an incoming neap tide to minimize water velocities, thereby minimizing resuspension of sediment within Pond 15. During breaching, it is possible that some scour and associated resuspension could occur within the two channels located within Pond 15; therefore, monitoring of turbidity levels in Pond 15 shall be conducted during the breaching process. If evidence of scour or resuspension of sediment is observed, then work shall be suspended until silt curtains are installed across the interior channels of Pond 15 to minimize turbidity and reduce the amount of resuspended sediment that could exit Pond 15 and enter San Diego Bay. **MM-HYD-2** The Service shall ensure that prior to initiating the excavation of the inlet/outlet channel in the area immediately to the north of Pond 15 in San Diego Bay (as well as within Pond 15 should the levee be breached before the portion of the channel to be located within the boundaries of Pond 15 has been excavated) that a silt curtain has been deployed around the entire inlet/outlet channel work area to minimize turbidity impacts to Bay waters as result of excavation activities. In addition, the Service shall ensure that monitoring is conducted during the excavation process to verify that turbidity levels outside of the area enclosed by the silt curtain are within acceptable levels (i.e., within 20 percent of the turbidity level measured in adjacent areas of the bay undisturbed by project activity). If acceptable levels are exceeded, excavation operations shall be stopped until the Service is assured that corrective measures are in place to reduce turbidity levels outside of the silt curtain to acceptable levels. Following completion of the levee breach and excavation of the inlet/outlet at Pond 15, a qualified engineer shall inspect the site for erosion or sedimentation impacts and the structural integrity of the levee. A report outlining the findings of the inspection, along with the identification of any concerns and recommendations for appropriate actions to address any identified concerns, shall be provided to the Service within 30 days of the inspection. Similarly, silt curtains shall be installed and turbidity levels monitored around construction activities associated with reinforcing bridge piers and when installing rock for bank protection.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	~~**MM-HYD-1**: To minimize the potential for sediment plumes entering San Diego Bay during the levee breach, the Service shall ensure that the levee is breached only when turbidity levels are within 20% of ambient conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed across the breach for the first 24 hours, if deemed necessary, to further reduce potential distribution of fine-grained material and associated turbidity. Following completion of the levee breach and final construction of the inlet/outlet at Pond 15, a qualified engineer shall inspect the site for erosion or sedimentation impacts and the structural integrity of the levee.~~	
Mishandling or inadvertent release of hazardous materials during construction could adversely affect water quality.	**MM-HYD-~~2~~3**: Prior to commencement of construction activities, the contractor shall prepare to the satisfaction of the Service a hazardous substance management, handling, storage, disposal, and emergency response plan for all phases of construction. The plan shall address where and how construction vehicles will be parked, fueled, and serviced and what actions will be taken to avoid and reduce the risk of accidental release of hazardous materials (e.g., diesel fuel, gasoline, lubricants, coolant, oil solvents, cleaners) during construction activities at the site. The plan shall also identify the worst case spill scenario and list the protocols for spill prevention and response actions that would be taken in the event of unintended spillage of hazardous materials or unintended release of hazardous substances during construction activities. As part of plan implementation, a hazardous materials spill kit shall be maintained on site and a construction monitor shall be designated to ensure that all contractors are in compliance with applicable regulations, including regulations regarding hazardous materials and hazardous wastes, including disposal. Hazardous materials shall not be disposed of or released on the ground, in the underlying groundwater, or in any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including litter, garbage, and other solid waste, shall be diverted, recycled, or properly disposed of. Petroleum products and other potentially hazardous materials shall be removed to a waste facility permitted to treat, store, or dispose of such materials.	Less than significant
Adverse effects to water quality could occur if sediment is introduced into adjacent wetlands or stormwater systems during material transport within and between sites.	**MM-HYD-~~3~~4:** The Service shall ensure that appropriate measures are implemented by the contractor during the transport of excavated material from the Otay River Floodplain Site to the Pond 15 Site to prevent the release ~~of~~ of excavated material and dust into adjacent upland and wetland habitats and open water areas, as well as to minimize the potential for tracking ~~and the tracking of~~ dirt onto surface streets. Such measures shall include always covering the loads of trucks hauling ~~sediment~~ excavated or other loose materials ~~or~~ on public streets and requiring ~~them~~ trucks hauling materials within the project site to maintain at least 2 feet of freeboard (i.e., vertical space between the top of the load and top of the trailer); watering active haul roads and staging areas as needed to minimize the generation of	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	dust from construction activity; installing wheel washers where vehicles enter and exit unpaved roads; conducting daily street sweeping if visible soil materials are carried to adjacent streets; and establishing construction traffic speeds of 15 miles per hour or less on all unpaved roads. All construction workers shall be educated on proper protocols for loading, transport, and unloading of trucks prior to commencement of soil-hauling activities. If excavated material is to be transported between the Otay River Floodplain Site and the Pond 15 Site via conveyor belt, the following procedures shall be followed: a. While excavated material is being loaded onto the conveyor belt for transport to Pond 15, the Contractor shall ensure that dust suppression is performed in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive. b. During or after the excavated material is loaded onto the conveyor belt, the excavated material shall be sprayed with water to prevent material from blowing off the conveyor belt and if necessary, the material will be tarped to prevent dust emission and/or the spilling of excavated material from belt. Tarps or catchment aprons shall be install on the underside of the conveyor belt where it crosses the Otay River or crosses or borders any salt ponds in areas where there would be the potential for the water and substrate within the ponds to be contaminated by spillage from the conveyor belts. c. The process shall be continually monitored to ensure that excavated material is not entering any water bodies, including the Otay River and nearby salt ponds. If necessary to protect water quality, additional measures will be implemented to minimize the loss of excavated material from the belt. Additionally, a soil transport monitoring plan shall be prepared by the construction contractor for review and approval by the Service prior to commencement of soil transport activities. The soil transport monitoring plan shall include operational protocols to ensure that unanticipated spills of transported soil material do not occur from conveyor belt or truck transport operations and monitoring protocols to detect any spills that do occur. The monitoring plan shall also include remediation actions that will be implemented in the event of unintended spill or leakage of excavated material into adjacent wetland areas and salt ponds during soil transport via conveyor belt or truck transport.	

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
~~Adverse effects to water quality could occur if sediment is introduced into adjacent wetlands or stormwater systems during material transport via conveyor belt or slurry pipeline within and between sites.~~	~~**MM-HYD-4:** If soil transport between the Otay River Floodplain Site and the Pond 15 Site would be conducted via conveyor belt or slurry pipeline, a soil transport monitoring plan shall be prepared by the construction contractor for review and approval by the Service prior to commencement of soil transport activities. The soil transport monitoring plan shall include monitoring protocols to ensure that unanticipated spills of transported soil material would not occur from conveyor belt or slurry pipeline operations. The monitoring plan shall include what actions will be taken in the event of unintended spill or leakage of soil or slurry material into adjacent wetland areas and salt ponds during soil transport via conveyor belt or slurry pipeline.~~	Less than significant
	Noise	
Noise generated during construction could result in adverse effects to sensitive noise receptors.	**MM-NOI-1**: a. Construction plans shall indicate that the hauling of material from the Otay River Floodplain Site to the Pond 15 Site will only be conducted between the hours of 7 a.m. and 7 p.m. Monday through Saturday and is not permitted on Sundays or between the hours of 7 p.m. and 7 a.m. on any day. b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. c. Construction noise reduction methods, such as shutting off idling equipment, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools rather than diesel equipment, shall be used. d. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded from sensitive noise receptors. e. During construction, ~~stockpiling~~ construction and vehicle staging areas shall be located as far as practical from noise-sensitive land uses.	Less than significant
	Biological Resources	
Adverse effects to biological resources could occur if the project results in the permanent loss of native habitat or plant communities.	**MM-BIO-1**: To avoid or minimize the permanent loss of native habitat or plant communities resulting from project features, any areas that are bridged, reinforced, or widened to accommodate construction equipment would be restored to pre-construction conditions and vegetated with appropriate native plant species once construction is complete per the Construction Methods as described in Section 2.3.2.4 of this environmental impact statement. This includes the 1.36 acres of jurisdictional impacts. To avoid or minimize any long-term impacts to habitat or vegetation, staging	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	areas, access routes, and other disturbed areas shall be decompacted and recontoured to ensure proper site drainage, and revegetated with appropriate native species. Any temporary equipment, structures, or utilities (e.g., water, power) installed at the project site shall be removed at the completion of construction. Impacts from project features that cannot be restored to pre-construction conditions due to the requirements of the construction will be mitigated per the restoration outlined in the FRP. In addition, the temporary impacts (0.62 acre) to the California Coastal Commission-only wetlands (mule fat scrub and Otay River Floodplain Restoration Site) shall be replaced in kind immediately upon completion of construction.	
Adverse effects to wetlands under Alternatives B and C would be significant if mitigation is not adequate.	**MM-BIO-2**: Mitigation for conversion of wetlands from one type to another resulting from implementation of Alternative B (or Alternative C) shall be provided at mitigation ratios of 1:1 and 4:1. ~~in accordance with the Final Restoration Plan (FRP; Appendix C) at a 1:1 ratio. Mitigation is provided at a 1:1 ratio for the impact to 5.77 acres in the Otay River Floodplain Site and 84.37 acres at the Pond 15 Site. Mitigation shall provide 90.14 acres of tidally influenced wetlands. The combined total for the mitigation is 114.26 acres.~~	Less than significant
Potentially significant impacts may occur if mitigation ratios are not adequately implemented.	**MM-BIO-3**: Mitigation for permanent impacts to wetlands resulting from implementation of Alternative B (or Alternative C) shall be provided at mitigation ratios of 1:1 and 4:1. Mitigation for permanent impacts to wetlands for high tide refugia resulting from implementation of Alternative B shall be provided at a 2:1 ratio. Mitigation for the raising of the levee at Pond 22/23 shall be provided at a 4:1 ratio. ~~Mitigation for permanent impacts to wetlands resulting from implementation of Alternative B (or Alternative C) shall be provided at mitigation ratios of 1:1 and 4:1. Mitigation for permanent impacts to wetlands for high tide refugia resulting from implementation of Alternative B shall be provided at a 2:1 ratio. Mitigation for the raising of the levee at Pond 22/23 shall be provided at a 4:1 ratio.~~	Less than significant
Adverse effects may occur if erosion results in excessive sedimentation within sensitive habitat areas.	**MM-BIO-4**: Prior to construction, the boundaries of the project site, including staging areas~~, stockpiles~~, and truck haul routes, shall be flagged and protective fencing/silt fencing shall be installed to the satisfaction of the San Diego Bay National Wildlife Refuge (NWR) Manager or designated project biologist as approved by the Service. Silt fencing shall also be installed around all existing cismontane alkali marsh to protect it from sedimentation, excessive runoff, and human intrusion. Construction plans shall include notes or mapping of the location of the protective fencing. In addition, a biological monitor shall be present during the pre-construction meeting and during initial grading of these areas to ensure that no construction activity occurs outside the designated construction boundaries. The biological monitor shall be on site during clearing, grubbing, and grading activities to ensure that the approved limits of disturbance are not exceeded.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	The biological monitor shall also conduct periodic monitoring of ~~stockpiles,~~ storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, all workers shall be educated by an approved biologist to recognize and avoid those areas that have been marked as sensitive. In addition to the measures described under MM-HYD-3 and MM-HYD-4, the project biologist shall monitor conditions in sensitive habitat areas located adjacent to ongoing construction to ensure that no impacts related to sedimentation are occurring. If impacts are noted, additional measures shall be developed and implemented to minimize the effects of dust and sedimentation on sensitive resources.	
~~Adverse effects to wetlands under Alternative C would be significant if mitigation is not adequate.~~	~~**MM-BIO-5**: Mitigation measures for conversion of wetlands from one type to another resulting from implementation of Alternative C shall be provided in accordance with the FRP (Appendix C) at a 1:1 ratio.. Mitigation is provided at a 1:1 ratio for the impact to 5.80 acres in the Otay River Floodplain Site and 82.77 acres at the Pond 15 Site. Mitigation shall provide 88.57 acres of tidally influenced wetlands. The combined total for the mitigation is 112.57 acres.~~	~~Less than significant~~
~~Potentially significant impacts under Alternative C may occur if mitigation ratios are not adequately implemented.~~	~~**MM-BIO-6**: Mitigation for permanent impacts to wetlands resulting from implementation of Alternative C shall be provided in accordance with the FRP (Appendix C) at a 4:1 ratio. Mitigation is provided at a 4:1 ratio for the loss of 0.64 acres in the Otay River Floodplain Site and 5.37 acres at the Pond 15 Site and 0.98 acre associated with the project features permanent jurisdictional impacts. Mitigation shall provide 27.96 acres of tidally influenced wetlands. The combined total for the mitigation is 112.57 acres.~~	~~Less than significant~~
Potentially significant impacts under Alternative C occur because full mitigation acreage is not achieved.	**MM-BIO-7**: Permanent impacts to wetlands resulting from implementation of Alternative C would not be entirely offset by the wetland acreage provided as part of the FRP. ~~The total mitigation requirement based on the mitigation ratios and impacts is 116.53 acres. The acreage that is provided per the FRP is 112.57, resulting in a deficit of 3.96 acres.~~ This deficit shall be mitigated through the purchase of wetland mitigation credits at an agency-approved mitigation bank ~~for a total of 3.96 credits~~.	Less than significant
Adverse effects to estuary seablite could occur as a result of restoration.	**MM-BIO-8**: To mitigate for the loss of estuary seablite (*Suaeda esteroa*), a sensitive plant species, from the Otay River Floodplain Site and Pond 15 Site, estuary seablite shall be included in the planting palette. Estuary seablite planting shall be included in the mid-high marsh habitat and shall be planted at a 2:1 ~~(new:impacted)~~ mitigation ratio <u>in newly created mid to high marsh areas, and</u> <u>*L~~l~~yceum californicum*</u> <u>and</u> <u>*Suaeda taxifolia*</u> <u>shall be included in the planting palette for the new wetlands at a 1:1 ratio</u>. A monitoring plan and success criteria for evaluating estuary seablite populations shall be included in the Revegetation Plan required by MM-VIS-1.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
Adverse effects to special-status bird species could occur during construction.	**MM-BIO-9: Special-status birds.** No earlier than 30 days prior to the commencement of clearing, grubbing, and earth movement on the project site, the NWR Manager and/or project biologist shall conduct focused pre-construction surveys for light-footed Ridgway's rail (*Rallus obsoletus levipes*) and other avian species (such as western snowy plover (*Charadrius ~~a~~nivosus~~lexandrines~~ nivosus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*) and burrowing owl (*Athene cunicularia*)) in the vicinity of the project site. Daily surveys for the presence of rails (family Rallidae) and other sensitive bird species shall be conducted at the Otay River crossing, in the Palomar channel, and in other potential rail habitat areas in the vicinity of the project. If sensitive species are present, an air horn or cracker shells shall be deployed to move the birds off the site prior to commencement of construction activities. If noise proves ineffective, physical presence may be used to haze birds and move them to safer parts of the San Diego Bay NWR. Such monitoring shall continue throughout the day to discourage rails and other birds from moving back into the project site, particularly during periods when construction equipment is not operational, such as during breaks. A subsequent pre-construction survey shall be conducted prior to the commencement of construction activities in subsequent years and daily monitoring should be reinitiated until all construction activity ceases on the project site.	Less Than Significant
Adverse effects to nesting seabirds and shorebirds	**MM-BIO-10:** To avoid impacts to nesting birds, all construction activity in and surrounding the Otay River Floodplain Site and the Pond 15 Site shall be confined to the period between September 30 and February 15, unless work outside this period is authorized by the Refuge Manager.	Less then significant
Adverse effects to East Pacific green sea turtles and/or marine mammals could occur during the breaching of Pond 15.	**MM-BIO-11~~0~~: East Pacific green sea turtle.** A qualified biologist shall be on site during preparation for and implementation of the breaching of the Pond 15 levee to visually monitor for the presence of East Pacific green sea turtle (*Chelonia mydas*) and other sensitive species. The biologist shall have the authority to halt construction when wildlife is observed within or near the project site. Should working vessels (e.g., dredge, barge) be used to breach the Pond 15 levee, travel in the area would adhere to a 5-mile-per-hour speed limit. ~~If pipelines are used, the pipe will be laid such that at least 3 feet of water is available for a turtle to pass through the area at low tide.~~ Land and/or water work crews shall be briefed on how to identify sea turtles and marine mammals that could occur in vicinity of the area affected by the breaching process. The biological monitor shall prepare incident reports of any observed sea turtle activity, and shall provide such reports to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries) within 24 hours of an observation. In the event of an incident involving a marine mammal or sea turtle, the Service shall immediately contact the NOAA Fisheries Southwest Regional Office's Stranding Coordinator, and shall submit a report to NOAA Fisheries within 24 hours.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
Adverse effects to eelgrass could occur during construction.	**MM-BIO-12~~1~~: Eelgrass.** Eelgrass (*Zostera* spp.) surveys, consistent with the requirements outlined in the 2014 California Eelgrass Mitigation Policy (CEMP), shall be conducted to detect any impacts to eelgrass in the vicinity of the proposed action as a result of breaching Pond 15 and/or opening the proposed restoration area on the Otay River floodplain to tidal action. Pre-breaching surveys for Pond 15 shall be conducted in San Diego Bay from the proposed opening of Pond 15 to the southeast corner of the Chula Vista Wildlife Reserve and at an appropriate reference site. Pre-opening surveys for the proposed restoration area on the Otay River floodplain shall be conducted in the Otay River channel between the opening of Pond 10 and the outlet in Pond 11; in the tidal channels of Ponds 10 and 11; and at an appropriate reference site. The same surveys shall be conducted within 30 days of breaching Pond 15 and 30 days of opening the Otay River floodplain tidal basin to the Bay. If impacts to eelgrass from implementation of the proposed action are identified, mitigation shall be provided in compliance with the CEMP. The Service shall develop an Eelgrass Mitigation Plan that includes a description of the impact, identification of a mitigation site that provides mitigation at the appropriate ratio, identification of a suitable local reference site, success criteria for the mitigation site and a monitoring plan for the mitigation and reference sites. Monitoring reports shall be filed with the resource agencies and the Executive Director of the California Coastal Commission.	Less than significant
	Cultural Resources	
Adverse effects to historic cultural resources may occur as a result of the project.	**MM-CUL-1:** Prior to commencement of any project excavation, a Memorandum of Agreement between the Service and the State Historic Preservation Office (SHPO) shall be signed that requires the following stipulations to be completed within 1 year of the commencement of project excavation: (1) in addition to the existing Historic American Landscape Survey (HALS) documentation, entitled *Cultural Resources Evaluation for the U.S. Fish and Wildlife Service Otay River Estuary Restoration Project, Otay Mesa, San Diego County, California*, supplemental photodocumentation will be conducted for Ponds 13, 14, and 15 and the northern portion of Pond 20A; (2) oral history research will be conducted to document the history of the salt works and its ultimate inclusion in the San Diego Bay National Wildlife Refuge (NWR), as well as the 100-year-plus salt-making process at this site; (3) an overview of the salt works history will be posted on the NWR website; ~~and~~ (4) an interpretive panel that expands upon the interpretation already developed to inform visitors of the historic significance of the salt works and an interpretive panel developed in partnership with the Sycuan Bancd of the Kumeyaay Nation, which addresses traditional ecological	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	knowledge and resource exploitation of San Diego Bay, will be designed, fabricated, and installed on the NWR; and (5) a link to an appropriate website addressing the history of the Kumeyaay Nation will be posted on the Refuge website.~~will be designed, fabricated, and installed on the NWR.~~	
Adverse effects to historic cultural resources may occur as a result of construction vehicles accessing the Pond 15 Site.	**MM-CUL-2**: The Service shall ensure that prior to the commencement of construction activities at either the Otay River Floodplain Site or the Pond 15 Site, the construction contractor has implemented protective measures such as temporary ballasts, wood beams, or other protective crossing mechanisms to protect the historic rail tracks located along Bay Boulevard at the construction access point to the Pond 15 Site. These temporary protective measures shall be periodically inspected to ensure their integrity and shall remain in place until all construction activity has ceased within the Pond 15 Site.	Less than significant
Excavation could result in adverse effects to archaeological resources.	**MM-CUL-3**: A qualified archaeologist meeting the Secretary of the Interior's Standards and Guidelines: Professional Qualifications Standards and a qualified Kumeyaay cultural monitor shall monitor all grading and subsurface disturbance within the project's area of potential effect. If any cultural resources are discovered during excavation, all earthwork in the vicinity shall be halted and the Service's Regional Historic Preservation Officer shall be immediately contacted to review the materials and recommend a treatment that is consistent with applicable laws and policies. In addition to standard monitoring techniques, for monitoring in wet areas the archaeological and Kumeyaay cultural monitors will select 5-gallon samples of excavated sediment to be screened through 1/8 inch wire mesh screen. Wet sediments may be stockpiled and dried prior to sampling by the monitors, before sediments are re-compacted as fill on site or hauled off site. If artifacts or other resources are identified, then the Project archaeologist will determine, in consultation with the Service's Regional Historic Preservation Officer, if the discovery constitutes a potential intact resource. If potential intact resources are discovered, then the notification and treatment methods outlined in Mitigation Measure MM-CUL-4 would be implemented. The treatment plan would likely require the boundaries of the site to be defined before excavation can be reinitiated in the vicinity of the discovery. The site shall be recorded and evaluated for eligibility for listing in the National Register of Historic Places (NRHP). Once this work is completed, additional measures may be required, depending on the results of the eligibility determination. If	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	any site is encountered that is determined to be eligible for listing in the NRHP, the Service shall consult with the SHPO, federally recognized ~~Tribes~~tribes, and interested parties, and additional measures may be required. The archaeological and Kumeyaay cultural monitor shall provide a monitoring report to the Service's Regional Historic Preservation Officer and the San Diego Bay NWR Manager describing the activities and findings of the monitoring effort within 30 days of the completion of all monitoring activity. Summaries of all actions taken related to the discovery of cultural resources during site excavation shall be provided to the Service's Regional Historic Preservation Officer and the NWR Manager within 15 days of completion of the action.	
Excavation could reveal the presence of archaeological resources that require curation.	**MM-CUL-4**: All archaeological resources encountered on the San Diego Bay NWR shall be handled in accordance with federal regulations. With respect to artifacts collected on the San Diego Bay NWR, either as part of site investigations and recovery or inadvertent discovery during excavation, the Service will ensure proper care of Federally owned and administered archaeological collections, including ensuring that prehistoric and historic artifacts and associated records are deposited in an institution with adequate long-term curatorial capabilities that can provide professional, systematic, and accountable curatorial services on a long-term basis. The curation institution will meet the federal curation standards as required in 36 CFR 79.	Less than significant
Excavation could result in the inadvertent discovery of human remains.	**MM-CUL-5**: In the event of the inadvertent discovery of human remains, the Service's Regional Historic Preservation Officer and the San Diego County Coroner shall be immediately contacted per the Native American Graves Protection and Repatriation Act (NAGPRA) Section (3)(d)(1). All earthwork in the vicinity of the discovery shall be halted and the discovery site shall be secured from further disturbance. If the remains are determined to be Native American, all required NAGPRA inadvertent discovery procedures, including, but not limited to, initiating consultation with the Kumeyaay Cultural Repatriation Committee, developing a plan of action, and repatriating any NAGPRA cultural items (i.e., funerary objects, sacred objects, objects of cultural patrimony) and/or human remains, shall be followed.	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	Traffic, Circulation, and Parking	
Construction activities occurring within public roadways could adversely affect traffic circulation in the affected area.	**MM-TRA-1:** Prior to the commencement of any sediment transport, a construction area traffic control plan or detour plan shall be prepared for each location where construction activities would encroach into the right-of-way of a public roadway. The plans would include, but not be limited to, such features as warning signs, lights, flashing arrow boards, barricades, cones, lane closures, flaggers, pedestrian detours, parking restrictions, and restricted hours during which lane closures would not be allowed (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the Service.	Less than significant
Increases in vehicle traffic associated with truck trips could adversely affect traffic circulation in the area during peak traffic hours.	**MM-TRA-2:** The contractor shall schedule all deliveries of construction materials and equipment to the project site to avoid peak-hour traffic congestion (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the Service.	Less than significant
	Public Utilities and Easements	
Adverse effects to utilities located in the vicinity of the project site could occur during construction.	**MM-UTL-1:** Prior to the completion of final project construction plans, individual utility agencies with utilities located within or adjacent to areas of construction activity shall be contacted to determine the extent and type of temporary protective measures that must be implemented to prevent construction damage to surface and subsurface utilities.	Less than significant
	Public Access and Recreational Opportunities	
Users of the Bayshore Bikeway could be adversely affected as a result of project construction.	**MM-REC-1:** 30 days prior to the start of any clearing and grubbing or mobilization(s), whichever occurs first, the contractor shall install warning and notification signs at the following locations: 1) along the Bayshore Bikeway in both directions and 50-feet away in both directions from the construction access point to the Pond 15 Site where vehicles will be crossing the Bayshore Bikeway and 2) at the Main Street/Frontage Road entrance to the Bayshore Bikeway in both directions and 50-feet away in both directions, as well as at the 13th Street entrance onto the east bound segment of the Bayshore Bikeway. The initial signs, to be posted 30 days prior to the start of construction, will alert riders of upcoming construction activity and the potential for future delays due to the presence of construction vehicles. Prior to initiating construction and installing protective materials on the bike path, the initial signs shall be replaced with warning signs informing riders to expect delays due to construction vehicles crossing the bikeway or entering Main Street from the project site, as applicable. Where protective materials will be installed on the bicycle path, the warning signs shall clearly~~ing~~ alert riders to slow down due to the uneven surfaces that the protective materials will create. The contractor shall maintain all signs in good order throughout	Less than significant

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
	each of two construction periods. At the end of each construction period, the Bayshore Bikeway shall be returned to documented pre-project conditions. Prior to commencement of the second year of construction, the same signage procedures shall be followed as described above. Similarly, at 50-feet away from the Main Street entrance (north end) and at and 50-feet away from the Saturn Boulevard entrance (south end) to the Saturn Boulevard bike path initial signs shall be installed 30 days prior to construction to alert riders about the upcoming construction and associated temporary reroute of the bike path, including a map indicating where the reroute will be located, and two weeks prior to construction, signs, with a map of the rerouted section, shall be installed to direct users onto and along the rerouted section of trail. In addition, warning signs shall be installed 50-feet away from Main Street along the reroute informing users of presence of construction vehicles entering and exiting Main Street and the potential for delays. The temporary reroute and all directional signs shall be maintained throughout the two-year construction period. Prior to commencement of the second year of construction, the same warning sign procedures shall be followed as described above. At the end of construction, the Saturn Boulevard bike path shall be returned to documented, pre-project conditions. During active construction, flaggers shall be present to control trucks and bicycle traffic on the Bayshore Bikeway, with flaggers present at the Main Street/Frontage Road entrance to the Bayshore Bikeway, at the construction access point to the Pond 15 Site, and at the northern extent of the rerouted Saturn Boulevard bike path. The contractor shall maintain the bikeway in good repair at all times, frequently remove any dirt or debris deposited on the bikeway or Main Street by trucks and construction equipment, and provide protective barriers as necessary. ~~Prior to any construction activity in the Bayshore Bikeway, the contractor shall install signs to alert riders to the presence of protective materials on the path and of potential intermittent closures during construction. During active construction, flaggers shall be present to control trucks and bicycle traffic on the Bayshore Bikeway, with flaggers present at the Main Street/Frontage Road entrance to the Bayshore Bikeway, as well as at the access point to the Pond 15 Site where the access point crosses the Bikeway. The contractor shall maintain the Bikeway in good repair at all times, provide protective barriers as necessary, and be responsible for restoring the Bikeway to pre-project conditions following completion of construction activities.~~	

Table ES-1
Summary of Significant Environmental Impacts for Alternative B and Alternative C

Impact	Mitigation Measures	Level of Significance After Mitigation
Users of the Saturn Boulevard bike path could be adversely affected as a result of project construction.	**MM-REC-2:** Prior to the commencement of project construction, a reroute of the Saturn Boulevard bike path shall be designed and required approvals obtained~~permitted~~, and prior to any other construction associated with the project, the contractor shall complete the approved temporary reroute of the bike path. Design, permitting, and construction shall be conducted in coordination with the City of San Diego Park and Recreation Department and Streets Division, as well as ~~and~~ County of San Diego Park and Recreation Department. The project construction documents shall indicate that the contractor is responsible for restoring the existing bike path to documented pre-construction conditions following completion of all construction activities.	Less than significant
	Economics and Employment	
Operations at the South Bay Salt Works could be adversely affected during construction.	**MM-ECO-1**: To avoid conflicts with ongoing salt works operations, prior to the start of construction, the contractor shall provide the salt works management with an up-to-date construction schedule and timeline of activities related to the restoration project. The salt works management shall also receive monthly updates of construction progress and shall be informed immediately of any changes in the proposed schedule or timeline.	Less than significant

Note: All mitigation measures will be implemented for both Alternative B and Alternative C unless otherwise specified.

ES.5 IMPACTS NOT FOUND TO BE SIGNIFICANT

Based on the analysis presented in the Draft and Final EIS, no significant adverse effects related to agricultural resources, air quality, climate change and sea-level rise, greenhouse gases, mineral resources, vectors and odors, and environmental justice are anticipated as a result of implementing any of the alternatives presented, including the preferred alternative.

ES.6 AREAS OF KNOWN CONTROVERSY

Three public scoping meetings for the project were held at the San Diego County Swiss Club, located at 2001 Main Street in Chula Vista, in 2011 and 2013. Public commenters at the scoping meeting expressed concerns about impacts related to sea-level rise, flooding, and public bird-watching. These concerns have been identified as areas of known controversy and are analyzed in the Draft EIS. Appendix~~ces A and~~ B contains the scoping reports prepared for the scoping meetings, list of attendees, and comment letters that were received. Additional concerns were raised in comment letters received during the public review period. The comment letters and responses are provided in Appendix A of the Final EIS.

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CHAPTER 1
INTRODUCTION

1.1 PROJECT OVERVIEW

The Otay River Estuary Restoration Project (ORERP or proposed action) is a partnership between the U.S. Fish and Wildlife Service (Service) and Poseidon Resources (Channelside) LP (Poseidon) to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species, and to provide habitat for migratory seabirds and shorebirds and salt marsh–dependent species within the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (NWR). The ORERP is intended to implement the habitat restoration objectives of the San Diego Bay NWR Comprehensive Conservation Plan (CCP) (USFWS 2006), and fulfill the applicable terms and conditions of the permits issued to Poseidon by the California Coastal Commission (Commission) and San Diego Regional Water Quality Control Board (Regional Board) for the Carlsbad Desalination Plant Project. The partnership between the Service and Poseidon provides public benefits by restoring coastal wetlands and wildlife habitats within the San Diego Bay NWR, and allows Poseidon to meet its mitigation requirements for the Carlsbad Desalination Plant Project.

The proposed action is located on two non-contiguous sites within the South San Diego Bay Unit of the San Diego Bay NWR (Figure 1-1 and Figure 1-2). The first restoration site, referred to herein as the Otay River Floodplain Site, is an approximately 33.51-acre area of primarily disturbed uplands within the Otay River floodplain that would be restored to estuarine, intertidal, and upland habitats (see Figure 1-3). The second restoration site, referred to herein as the Pond 15 Site, is a 90.90-acre active solar salt pond (currently used for commercial salt production from seawater evaporation) that would be restored to subtidal and intertidal habitats (see Figure 1-4). The proposed action would include a number of project features necessary to facilitate restoration of the Otay River Floodplain Site and Pond 15 Site, which are described in detail in Chapter 2, Alternatives, of this Environmental Impact Statement (EIS). The associated project features would occur in various locations, affecting a total of 40.9 acres. The total acreage for the proposed action as a whole, consisting of the Otay River Floodplain Site, the Pond 15 Site, and all associated project features, would be approximately 165.3 acres.

This draft EIS analyzes the potential effects to the environmental of implementing each of the action alternatives and the no action alternative. The analysis is intended to tier from the programmatic EIS and Record of Decision prepared for the San Diego Bay NWR CCP (USFWS 2006; 71 FR 64552–64553). The programmatic EIS for the CCP evaluated alternatives for restoring the Otay River floodplain, and restoring and enhancing the San Diego Bay NWR's existing solar salt ponds. The Final EIS for the San Diego Bay NWR CCP is incorporated by reference into this document.

This Draft EIS for the ORERP was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 U.S.C. Section 4341 et seq.) and in conformance with the

Council on Environmental Quality's NEPA guidelines. The Service is the federal lead agency under NEPA. The U.S. Army Corps of Engineers, based on its jurisdiction by law and special expertise pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), has agreed to participate as a cooperating agency, pursuant to Title 40 of the Code of Federal Regulations, Section 1501.6, on the preparation of the ORERP EIS.

1.2 PROJECT LOCATION

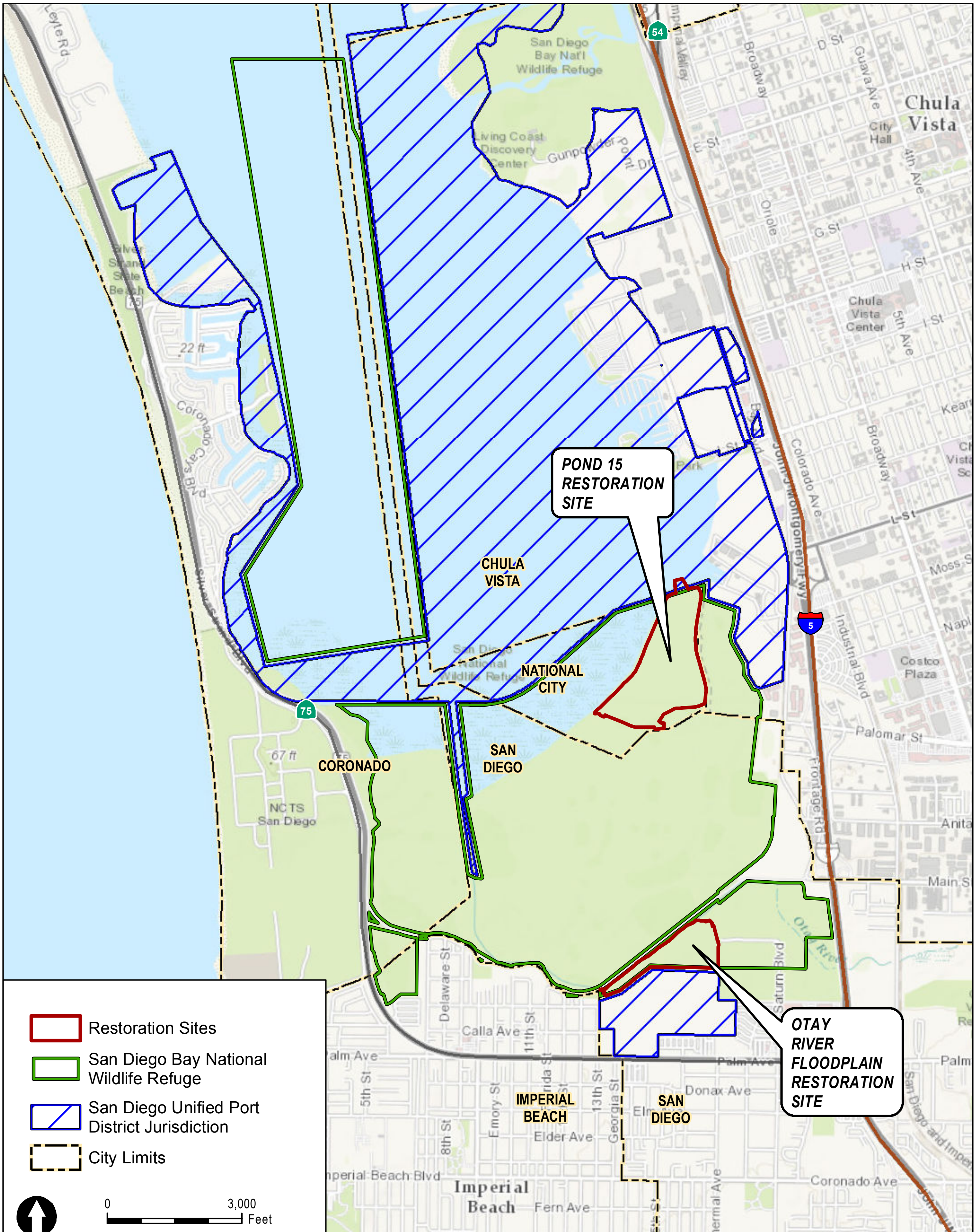
The ORERP site is located at the south end of San Diego Bay, in San Diego County, California, within the boundaries of the South San Diego Bay Unit of the San Diego Bay NWR, and is composed of two separate sites: the Otay River Floodplain Site and the Pond 15 Site. Both the Otay River Floodplain Site west of Nestor Creek and the Pond 15 Site are located on sovereign land held by the California State Lands Commission for the benefit of the people of the state and leased to the Service for management as part of the San Diego Bay NWR. The Otay River Floodplain Site east of Nestor Creek is owned by the Service. The Otay River Floodplain Site is situated within the limits of the City of San Diego, and the Pond 15 Site is within the limits of the City of National City. The City of Chula Vista is east of the Pond 15 Site. Directly to the south of the Otay River Floodplain Site and to the south and east of the Pond 15 Site are lands included within the City of San Diego. The City of Imperial Beach is located directly southwest of the Otay River Floodplain Site.

The approximately 33.51-acre Otay River Floodplain Site is located west of Interstate 5 between Main Street to the north and Palm Avenue to the south (refer to Figure 1-1, Regional Map, and Figure 1-2, Vicinity Map). The 90.90-acre Pond 15 Site is located in the northeast portion of the South San Diego Bay Unit of the San Diego Bay NWR, northwest of the intersection of Bay Boulevard and Palomar Street in Chula Vista (refer to Figures 1-1 and 1-2).

1.3 PROJECT BACKGROUND

San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan and Environmental Impact Statement

In 2006, the Service completed the San Diego Bay NWR CCP, associated Final EIS, and accompanying Record of Decision (USFWS 2006; 71 FR 64552–64553). The CCP guides the management of the San Diego Bay NWR over a 15-year period, and describes, among other things, the wildlife and habitat management goals and objectives for the Sweetwater Marsh and South San Diego Bay Units of the San Diego Bay NWR. For the purpose of this ORERP EIS, only the habitat restoration elements for the South San Diego Bay Unit as described in the CCP (USFWS 2006) are applicable and discussed (refer to Section 1.5.2 of this EIS for a list of these goals).



BASE SOURCE: ESRI

FIGURE 1-1

Regional Map

Otay River Estuary Restoration Project EIS

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SOURCE: BING MAPPING SERVICE

FIGURE 1-2
Restoration Sites Vicinity Map

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SOURCE: BING MAPPING SERVICE

FIGURE 1-3

Otay River Floodplain Restoration Site Vicinity Map

Otay River Estuary Restoration Project EIS

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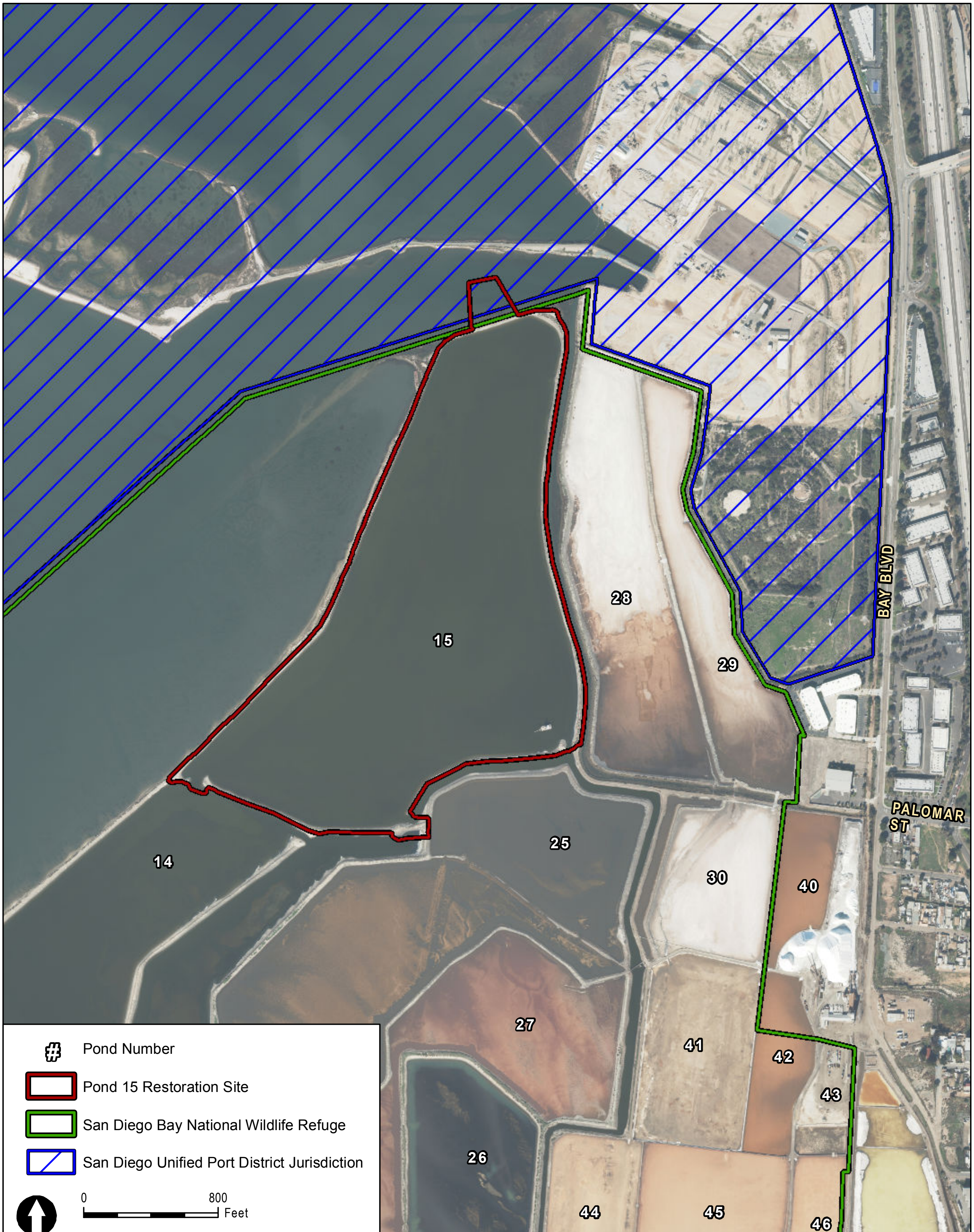

SOURCE: BING MAPPING SERVICE

FIGURE 1-4

Pond 15 Restoration Site Vicinity Map

Otay River Estuary Restoration Project EIS

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The CCP (USFWS 2006) evaluated the no action alternative and three action alternatives for the South San Diego Bay Unit. The CCP also evaluated two restoration options for the Otay River Floodplain Site. Each alternative included a phased approach to restoration, such that the proposals of the previous alternative (i.e., Alternative C) were included and expanded into the next alternative (i.e., Alternative D). This approach allows the Service to implement individual elements from each alternative based on available funding and project phasing.

The restoration of estuarine, salt marsh, and upland terrestrial habitats in the Otay River Floodplain Site is similar to the Alternative C – Otay River Floodplain Restoration Option 1 ~~2 Expanded Tidal Wetlands~~, described in the CCP (USFWS 2006). ~~In addition,~~ This restoration complements the riparian woodland restoration ~~portion of Option 2 Expanded Tidal Wetlands is presently being~~ recently implemented by the San Diego Bay NWR in partnership with River Partners, a non-governmental organization working with the Service to restore between 50 and 65 acres of riparian habitat directly east of the ORERP site. Similar to D, the selected restoration alternative for the salt works ~~Alternative C – Option 2 Restored Primary Ponds~~ as outlined in the CCP (USFWS 2006), ~~under~~ the ORERP, ~~tidal influence~~ would ~~be~~ restore~~d~~ tidal influence in ~~the~~ Pond 15 ~~Site~~ to support ~~the restoration of~~a range of tidally influenced ~~intertidal salt marsh~~ wetland habitat. ~~The~~ Consistent with the CCP, the levees surrounding the Pond 15 Site would be widened, ~~and~~ recontoured to gently slope down from the levee top into the area of restored ~~salt marsh~~ habitat, and topped with appropriate substrate to support nesting seabirds. The water circulation system for the ~~existing~~ remaining solar salt evaporation ~~process~~ ponds would be reconfigured to facilitate the South Bay Salt Works' ~~continued brine water management leading to the~~ commercial production of salt. ~~within the remaining salt ponds, exclusive of the Pond 15 Site.~~

Marine Life Mitigation Plan for the Carlsbad Desalination Plant

On November 15, 2007, the Commission approved a Coastal Development Permit (CDP) (CDP No. E-06-013) for Poseidon's proposal to construct and operate a desalination plant in the City of Carlsbad, San Diego County, California. As part of that approval, the Commission required Poseidon, through Special Condition 8, to submit for additional Commission review and approval, a Marine Life Mitigation Plan (MLMP) to address the impacts to be caused by the Carlsbad Desalination Plant's use of estuarine water and its entrainment and impingement of marine organisms. The MLMP was conditionally approved by the Commission on August 6, 2008 (California Coastal Commission 2008). The Commission's requested revisions were incorporated, and the MLMP was finalized on November 21, 2008 (Poseidon 2008). On May 9, 2009, the Regional Board added a fish productivity requirement and approved the MLMP as a condition of the National Pollution Discharge Elimination System permit required for the Carlsbad Desalination Plant, as incorporated within the March 27, 2009, Minimization Plan. As a condition of its approval, the Regional Board required that mitigation occur within San Diego County unless all other opportunities for restoration within San Diego County proved to be infeasible. This approval is outlined within Order No. R9-2009-0038 (RWQCB 2009). In 2009, based on a determination by the Regional Board and the Commission that Poseidon had incorrectly calculated expected impingement from its proposed open ocean intakes, Poseidon was required to increase the number of restored acres from 55.4 to 66.4 to provide 11.0 additional acres.

To offset the potential impingement and entrainment impacts from the Carlsbad Desalination Plant, the MLMP required creation, enhancement, or restoration of aquatic and wetland habitat, and ensured long-term performance, monitoring, and protection of the approved mitigation measures in a manner consistent with the California Coastal Act Sections 30230 and 30231. Specifically, the MLMP and associated actions described above required Poseidon to submit a proposed mitigation site and preliminary restoration plan that would achieve the minimum standards and incorporate as many as feasible of the objectives set forth by the Commission as presented below.

- **Minimum Standards**
  - Location within Southern California Bight (the curved coastline of Southern California from Point Conception to the Mexican border);
  - Potential for restoration as tidal wetland, with extensive intertidal and subtidal areas;
  - Creates or substantially restores a minimum of 37.0 acres and up to 55.4 acres of habitat similar to the affected habitats in Agua Hedionda Lagoon (to offset the potential impingement and entrainment impacts from the Carlsbad Desalination Plant), excluding buffer zone and upland habitat area;
  - Provides a buffer zone of a size adequate to ensure protection of wetland values, and at least 100 feet wide, as measured from the upland edge of the transition area.
  - Any existing site contamination problems would be controlled or remediated and would not hinder restoration;
  - Site preservation is guaranteed in perpetuity (through appropriate public agency or nonprofit ownership, or other means approved by the Executive Director), to protect against future degradation or incompatible land use;
  - Feasible methods are available to protect the long-term wetland values on the site(s), in perpetuity;
  - Does not result in a net loss of existing wetlands; and
  - Does not result in a significant impact on endangered animal species or a significant unmitigated impact on endangered plant species.

- **Objectives**
  - Provides maximum overall ecosystem benefits, e.g., maximum upland buffer, enhancement of downstream fish values, provides regionally scarce habitat, potential for local ecosystem diversity;
  - Provides substantial fish habitat compatible with other wetland values at the site(s);
  - Provides a buffer zone of an average of at least 300 feet wide, and not less than 100 feet wide, as measured from the upland edge of the transition area;
  - Provides maximum upland habitat areas (in addition to buffer zones);
  - Restoration involves minimum significant impacts on existing functioning wetlands and other sensitive habitats;
  - Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals;
  - Restoration design is that most likely to produce and support wetland-dependent resources;
  - Provides rare or endangered species habitat;
  - Provides for restoration of reproductively isolated populations of native California species;
  - Results in an increase in the aggregate acreage of wetland in the Southern California Bight;
  - Requires minimum maintenance;
  - Restoration project can be accomplished in a reasonably timely fashion; and
  - Site(s) in proximity to the Carlsbad Desalination Plant.

In January 2010, Poseidon presented a comparison study to Commission staff, a Scientific Advisory Panel formed by Commission staff to provide scientific expertise to the Commission, and representatives from other federal and state agencies about the Southern California Bight based on the MLMP's objectives. The study concluded that the Otay River Floodplain Site was the most suitable mitigation site to fulfill the requirements, objectives, and restrictions outlined in the MLMP. Commission staff and members of the Scientific Advisory Panel reviewed Poseidon's analysis and concurred that the Otay River Floodplain Site was likely to meet the MLMP's requirements and objectives.

In October 2010, the Commission requested that the comparison study be expanded to include additional northern San Diego County sites that are located closer to the source of project impacts. These included seven of the original 11 sites designated in August 2008 and one additional site (Loma Alta Lagoon). The expanded comparison study evaluated 15 sites in the Southern California Bight based on the MLMP's objectives. Thirteen sites were eliminated from consideration because they did not meet MLMP minimum threshold requirements specifying mitigation type, mitigation size, site preservation, or mitigation timeliness. The remaining sites, the Otay River floodplain and Tijuana Estuary, were evaluated in full. Poseidon concluded that the Otay River Floodplain Site allowed for a greater degree of certainty for successful mitigation. On February 9, 2011, the Commission unanimously approved the Otay River Floodplain Site and preliminary restoration plan (California Coastal Commission 2011). The Otay River Floodplain Site was approved by the Regional Board on March 9, 2011 (RWQCB 2011). The Service and Poseidon entered into a Memorandum of Understanding to establish a partnership to facilitate restoration of property within the San Diego Bay NWR consistent with the CCP and Poseidon’s Commission permit requirements.

Since November 2011, the Service has worked with Poseidon’s project team in conjunction with staff from the Commission, Regional Board, Port of San Diego, California Department of Fish and Wildlife, California State Coastal Conservancy, U.S. Army Corps of Engineers, and the Commission’s Scientific Advisory Panel on potential design alternatives to the originally proposed preliminary restoration plan. Collectively, this collaborative relationship is known as the “MLMP Workgroup.” The MLMP Workgroup reviewed site opportunities and constraints, and evaluated restoration project design alternatives prior to finalizing the ORERP for the environmental review process. Subsequently, Poseidon developed preliminary restoration alternatives that met Commission requirements within the MLMP for the Otay River Floodplain Site. Each concept included subtidal; intertidal mudflat; intertidal low, mid-, and high salt marsh habitats; a wetland/upland transitional zone; and a buffer zone on the eastern and southern portions of the Otay River Floodplain Site. The alternatives differed in the specific acreage of each wetland zone and the manner in which these zones were laid out.

The results of the evaluation indicated that an estimated 750,000 to 1,000,000 cubic yards of soil would need to be disposed of during excavation of the Otay River Floodplain Site. This excavated soil could be used, in part, to support the Service’s plans to restore a portion of the salt ponds within the San Diego Bay NWR to the north of the Otay River Floodplain Site. The soil could help to achieve target elevation contours within the Pond 15 Site to restore intertidal wetland habitat that would transition from subtidal elevations up to elevations suitable to support emergent salt marsh vegetation. The MLMP Workgroup, therefore, refined two alternatives in the preliminary restoration plan for the ORERP to allow for the excavated soils to be used to establish tidal salt marsh at the Pond 15 Site (see Figure 1-2). In addition to meeting the goals of the MLMP, evaluation of alternatives included analysis of the potential to make the San Diego Bay NWR more resilient to impending sea-level rise.

In coordination with the MLMP Workgroup, Poseidon conducted several site-specific studies to aid in the development of restoration alternatives. Based on these studies, a revised mitigation site and preliminary restoration plan were proposed. The revised mitigation site would encompass two restoration areas, the Otay River Floodplain Site and the Pond 15 Site, located in the southeast corner of the South San Diego Bay Unit of the San Diego Bay NWR. The revised preliminary restoration plan would decrease the mitigation footprint of the Otay River Floodplain Site to the area west of Nestor Creek, avoiding potential impacts associated with cultural resources and contaminated soils that were identified during these preliminary studies, and expanding the mitigation area footprint to incorporate the Pond 15 Site. Poseidon would receive approximately 70% of the required wetland mitigation credit from the Pond 15 Site and approximately 30% from the Otay River Floodplain Site.

Under these revised alternatives, the MLMP requirements and objectives would be consistent with the goals and objectives identified in the CCP for the Otay River Floodplain Site and the Pond 15 Site. As a result, on September 14, 2012, Poseidon submitted a request to Commission staff for an extension of the November 3, 2012, deadline to submit a CDP application for the restoration work so that the integrated restoration project identified by the Service could be analyzed and included in the CDP application. The Commission's Scientific Advisory Panel agreed that the potential benefits from the conjunction of the two sites were substantial enough to justify the time extension request. The Commission's Executive Director granted an 18-month extension on October 15, 2012, with a new date to submit the CDP application by May 3, 2014. On December 11, 2013, the Commission approved the proposed modification to the Otay River Floodplain Site and preliminary restoration plan submitted by Poseidon, in compliance with the MLMP, approved on August 6, 2008, in accordance with Special Condition 8 of CDP No. E-06-013. The CDP application was submitted to the Commission on May 5, 2014.

1.4 PURPOSE AND NEED FOR THE ACTION

1.4.1 Need for the Action

As described in the CCP, prior to the 1900s, San Diego Bay was a fertile, shallow, flat-bottomed bay surrounded by extensive mudflats and salt marshes. However, as a result of historical dredging and filling implemented to accommodate ship movement and coastal development, only 22% of San Diego Bay's original salt marsh habitat and 8% of its original intertidal habitat remained prior to 2010. Additionally, the watersheds that flow into San Diego Bay now exist in highly altered conditions because of the construction of dams in the upper watershed, installation of hardscape and flood-control channels throughout the watershed, and the presence of continual low-level flows from urban runoff of imported water. The natural coastal habitats that remain provide habitat within the San Diego Bay NWR for three federally listed endangered species: light-footed Ridgway's rail (*Rallus obsoletus levipes*), California least tern (*Sternula antillarum browni*), and salt marsh bird's-beak (*Chloropyron maritimum*). They also provide habitat for three species listed as threatened—western snowy plover (Pacific Coast population Distinct Population Segment) (*Charadrius nivosus nivosus*), East Pacific green turtle (*Chelonia mydas*), and California gnatcatcher (*Polioptila californica californica*)—and one state-listed endangered species, Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*). Collectively, San Diego Bay's open waters, tidal mudflats, salt marsh habitat, and adjoining salt ponds provide resting, feeding, and nesting habitat for hundreds of thousands of migratory shorebirds, colonial seabirds, and wintering waterfowl. San Diego Bay contributes more protected, shallow bay habitats to the Pacific Flyway waterbird populations than any other bay or estuary along the 180-mile coastal region of Southern California (USFWS 2006).

The portions of the South San Diego Bay Unit of the San Diego Bay NWR where the proposed action would occur originally consisted of a mix of native wetland and upland habitat. Today, the site consists of a commercial solar salt operation to the south and east of the Otay River channel, and habitat disturbed by past solar salt production activities to the south of the Otay River channel and west of Nestor Creek. Although the south end of San Diego Bay was spared from extensive dredging, it has experienced loss of natural habitats due to the construction of solar salt ponds, as well as other industrial, agricultural, and municipal activities (USFWS 2006).

The proposal to restore coastal wetlands within the Otay River Floodplain Site and Pond 15 Site is consistent with the purposes for which the San Diego Bay NWR was established, including "to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds, and to maintain and enhance the biological diversity of native plants and animals" 16 U.S.C. § 1531-1543 (Endangered Species Act of 1973, as amended) and 70 Stat. 1119 (Fish and Wildlife Act of 1956, as amended) and "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. § 742f(a)(4). In addition, the proposed restoration will assist in achieving the following goals for the San Diego Bay NWR, as presented in the Refuge's Comprehensive Conservation Plan (CCP) (USFWS 2006):

- **Goal 1:**Protect, manage, enhance, and restore open water, coastal wetlands, and native upland habitat to benefit the native fish, wildlife, and plant species supported within the South San Diego Bay Unit.
- **Goal 2:**Support recovery and protection efforts for the federally and state listed threatened and endangered species and species of concern that occur within the South San Diego Bay Unit.
- **Goal 3:**Provide high quality foraging, resting, and breeding habitat for colonial nesting seabirds, migratory shorebirds and waterfowl, and salt marsh-dependent species.

The CCP also represents the Service's plan for managing the tidelands leased to the Service from the California State Lands Commission; therefore, this restoration project's consistency with the goals of the CCP ensures that this proposal meets the Service's prior commitment on managing state tidelands included within the project boundaries.

1.4.2 Purpose and Objectives

The purpose of the ORERP is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species, and to provide habitat for migratory shorebirds and other salt marsh–dependent species within the South San Diego Bay Unit of the San Diego Bay NWR, consistent with the goals and objectives of the CCP (USFWS 2006) and the applicable terms and conditions of the permits issued for the Carlsbad Desalination Plant Project. The objectives of the ORERP are as follows:

- **Objective 1.** Restore native habitats in the Otay River Floodplain Site: Restore approximately 30 acres of the Otay River Floodplain Site to a mix of tidally influenced wetlands.
- **Objective 2.** Restore tidal wetlands in a commercial solar salt pond: Restore approximately 85 acres of the Pond 15 Site to tidal circulation to San Diego Bay.
- **Objective 3.** Enhance seabird and shorebird nesting and foraging opportunities: Increase the area of suitable nesting and foraging habitat for ground nesting seabirds and shorebirds by providing expanded and enhanced habitat areas on the levees that surround the restored tidal wetlands within Pond 15.
- **Objective 4.** Restore light-footed Ridgway's rail habitat: Develop restoration plans for the salt ponds and Otay River Floodplain Site that take into consideration the habitat needs of the light-footed Ridgway's rail. Restore cordgrass-dominated salt marsh within the Otay River Floodplain Site and Pond 15 Site.
- **Objective 5.** Implement MLMP Requirements: Create or substantially restore tidal wetland habitat in the San Diego region at an available site that is protected against future degradation at a minimum of 66.4 acres of mitigation wetlands at a maximum of two sites and fish productivity of at least 1,717.5 kilograms per year.

  Monitor and maintain the project site in compliance with the MLMP over the full operating life of the Carlsbad Desalination Plant. Once Poseidon's mitigation duties are fulfilled, the site will serve as habitat to sensitive species within the San Diego Bay NWR and will be managed and maintained in accordance with the CCP.

1.5 PROJECT RELATIONSHIP TO LAWS, REGULATIONS, EXECUTIVE ORDERS, AND REQUIRED PERMITS

1.5.1 Federal Laws, Regulations, and Executive Orders

The following authorities, which apply to the proposed action, were considered in preparing this EIS for the ORERP:

- National Wildlife Refuge Administration Act, as amended (16 U.S.C. 668(dd) et seq.)

- National Wildlife Refuge System Improvement Act of 1997 (Public Law (PL) 105-57)
- National Environmental Policy Act of 1969 (42 U.S.C. 4331; PL 99-160)
- Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.)
- Fish and Wildlife Coordination Act of 1932, as amended
- Migratory Bird Treaty Act, as amended (16 U.S.C. 703 et seq.)
- Fishery Conservation and Management Act of 1976 (also referred to as the Magnuson-Stevens Fishery Conservation and Management Act), as amended (16 U.S.C. 1801–1882; 90 Stat. 331)
- Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451–1464, Chapter 33; PL 92-583, 86 Stat. 1280)
- Antiquities Act of 1906 (16 U.S.C. 431–433)
- Curation of Federally Owned and Administered Archaeological Collections; Antiquities Act of 1906 (36 Code of Federal Regulations 79)
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.)
- Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469–469c; PL 93-29)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa–470mm; PL 96-95; 93 Stat. 722)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.; PL 101-601)
- Clean Air Act, as amended (42 U.S.C. 7401 et seq.)
- Federal Water Pollution Act of 1948, as amended (Clean Water Act) (33 U.S.C. 1251–1376; Chapter 758; PL 845, 62 Stat. 1155)
- Rivers and Harbors Appropriation Act of 1899 (Rivers and Harbors Act) (33 U.S.C. 403; Chapter 425, March 3, 1899; 30 Stat. 1151)
- Executive Order 12372 (July 14, 1982), Intergovernmental Review of Federal Program
- Executive Order 13186 (January 10, 2001), Responsibilities of Federal Agencies to Protect Migratory Birds
- Executive Order 11990 (May 24, 1977), Protection of Wetlands
- ~~Executive Order 11988 (May 24, 1977), Floodplain Management~~
- Executive Order 11593 (May 13, 1971), Protection and Enhancement of the Cultural Environment
- Executive Order 13007 (May 24, 1996), Indian Sacred Sites

- Executive Order 13175 (November 6, 2000), Consultation and Coordination with Indian Tribal Governments
- Executive Order 12898 (February 11, 1994), Environmental Justice

1.5.2 Federal Management Plans

Implementation of the ORERP, which would occur within the boundaries of the South San Diego Bay Unit of the San Diego Bay NWR, must be consistent with San Diego Bay NWR purposes and the goals and objectives presented in the San Diego Bay NWR CCP (USFWS 2006). The following goals for the South San Diego Bay Unit as stated in the San Diego Bay NWR CCP also apply to all of the alternatives evaluated for the ORERP:

- **Goal 1.** Protect, manage, enhance, and restore open water, coastal wetlands, and native upland habitat to benefit the native fish, wildlife, and plant species supported within the South San Diego Bay Unit.
- **Goal 2**. Support recovery and protection efforts for the federally and state-listed threatened and endangered species and species of concern that occur within the South San Diego Bay Unit.
- **Goal 3.** Provide high-quality foraging, resting, and breeding habitat for colonial nesting seabirds, migratory shorebirds and waterfowl, and salt marsh-dependent species.
- **Goal 4.** Provide opportunities for compatible wildlife-dependent recreation and interpretation that foster public appreciation of the unique natural and cultural heritage of South San Diego Bay.

1.5.3 State Laws, Regulations, and Management Plans

The following state permits and approvals are required:

- **California Coastal Commission –** A CDP for the proposed action is required. In addition to consistency with the California Coastal Act, the CDP would also analyze the proposed action's consistency with the requirements, objectives, and restrictions in the MLMP. In accordance with the California Environmental Quality Act (CEQA), the CDP process is exempt from the requirement of preparing an Environmental Impact Report. The Commission's staff report and findings related to the CDP application for the proposed action will serve as the environmental analysis document prepared under the Commission's certified regulatory program. In addition, Appendix N of this EIS provides an analysis of the consistency of the ORERP with the specific provisions of the California Coastal Act. This will enable the Regional Board to analyze the proposed action for consistency with applicable policies.

- **San Diego Regional Water Quality Control Board –** A Clean Water Act Section 401 Water Quality Certification from the Regional Board is required. A construction dewatering permit may also be required once the construction method has been finalized.
- **San Diego County Air Pollution Control Board –** Compliance with Rule 1501 of the Air Pollution Control District's Rules and Regulations would be required.
- **San Diego Unified Port District –** A CDP, Right-of-Entry Permit, long-term agreement, and other agreements or approvals would be required prior to breaching Pond 15.

1.5.4 Required Permits

The ORERP is a joint effort between the Service and Poseidon. The following permits and approvals will be obtained:

- CDP for consistency with the California Coastal Act
- Clean Water Act Section 401 Water Quality Certification for wetland restoration from the Regional Board
- Clean Water Act Section 404 Permit and Rivers and Harbors Act Section 10 Permit
- Stormwater Pollution Prevention Plan (SWPPP) ~~A National Pollution Discharge Elimination System permit for construction~~
- CDP, Right-of-Entry Permit, long-term agreement, and other agreements or approvals required from the San Diego Unified Port District (Port) for encroachment into Port jurisdiction associated with breaching Pond 15.

If aspects of the proposed action, such as construction access roads or temporary realignment of the Saturn bike path, impact lands within the City of San Diego's permitting jurisdiction, permits may be required.

1.5.5 California Environmental Quality Act

Although compliance with CEQA is not required to implement projects proposed within the boundaries of the San Diego Bay NWR, implementation of the ORERP requires approvals, permits, and/or certifications from several state agencies (e.g., California Coastal Commission, San Diego Regional Water Quality Control Board) and the Port of San Diego, which are subject to CEQA compliance. As such, this EIS was prepared to aid these state and local agencies in making appropriate CEQA findings. Pursuant to Section 15221 of the CEQA Guidelines, which sets forth rules governing use of a NEPA document to satisfy CEQA, this EIS includes a discussion of mitigation measures and an analysis of the potential for growth-inducing impacts associated with implementation of the proposed action. Sections 4.1 through 4.6 of this EIS include an impact analysis and a discussion of mitigation measures that would be implemented to reduce impacts to below a level of significance. Section 6.2 of this EIS includes a discussion of both action alternatives' potential impacts associated with growth inducement, hazards, and energy. State and local agencies interested in using this EIS to satisfy their CEQA requirements have and continue to work closely with the Service in completing the NEPA review for the ORERP to ensure that the discussions included in this document meet the requirements of CEQA. CEQA noticing requirements, including coordination with the State Clearinghouse, have also occurred.

1.6 PUBLIC INVOLVEMENT

1.6.1 Summary of Scoping

The Service initiated public involvement for this proposed action with the publication of a Notice of Intent in the Federal Register to prepare an EIS and request for public comment on Monday, November 14, 2011 (76 FR 70480–70481). A similar notice, which also announced the public scoping meeting schedule, was published in the *San Diego Union Tribune* on the same day. The Service hosted two public scoping meetings at 1:30 p.m. and 6:00 p.m. on December 6, 2011, at the San Diego County Swiss Club, 2001 Main Street Chula Vista, California 91911. Both meetings included a presentation describing the actions to be analyzed in the EIS, purpose and need for the proposed action, and proposed action objectives. The first meeting included a tour of the site. A combined total of 22 people attended the meetings. In addition to the comments provided at the scoping meetings, a number of written comments were provided to the Service during the 45-day comment period, which began on November 14, 2011. A summary of the public comments collected during this public scoping period is provided below:

- Consider the overall ecosystem and connectivity of this proposed action in relation to the existing open space along South San Diego Bay, Otay River, and the Tijuana River Valley.
- Priority should be given to creating, restoring, and enhancing non-vegetated intertidal mudflats.
- Consider recreational opportunities that would not impact species.
- Provide specific habitat for a variety species and their uses, such as nesting and foraging.
- Consider the layout and ecological function of the site pre-development.
- Consider potential impacts from sea-level rise and catastrophic events.
- Maintenance of a large subtidal area would be difficult; consider a broad floodplain, contiguous with a salt marsh.
- Address siltation and trash from Otay River and Nestor Creek.
- Consider impacts associated with improving habitat for predator species.
- Consider a retention system in project design.

- Consider placing the dirt in the southern area of Pond 20 if there is going to be dirt and earth removed from the Poseidon site (the Port of San Diego directly requested that the Service not consider this as an option for the ORERP).
- Conduct sediment testing for toxicity and disposal.
- Consider improving small, human-powered boat (such as rowboat or kayak) access from the north shore of Imperial Beach or San Diego east of Imperial Beach.
- Work with the Port of San Diego and City of San Diego to comprehensively plan habitat restoration for all undeveloped parcels, including Pond 20A and City of San Diego park land.
- Ensure that berms are designed to prevent any water from intruding into the Port of San Diego land in Pond 20.
- Concern about how the Carlsbad Desalination Plant Project is connected with the proposed action (transfer of materials from Carlsbad).
- Require maintenance and monitoring for as long as the Carlsbad Desalinization Plant is in operation.
- Consider in the analysis the suitability of using the removed fill material as sand replenishment on the beaches of Imperial Beach.

The public scoping report prepared for the 2011 scoping period is provided as Appendix ~~A~~B.

Following revisions to the proposed restoration footprint, including the expansion of the Area of Potential Effect to incorporate the integrated salt pond restoration as part of the proposed action's alternatives (described in Section 1.3, Project Background), the Service published a second Notice of Intent and request for public comment in the Federal Register on January 8, 2013 (78 FR 00072). The Service also hosted another public scoping meeting on January 23, 2013, at the San Diego County Swiss Club. A total of 14 people attended this meeting. Comments were accepted at the meetings verbally and in writing, as well as after the meeting through February 8, 2013. A summary of the public comments collected during the second public scoping is provided below:

- Consider the specific impacts on all species, including predator species, impacts to eggs, and impacts to overall biodiversity.
- Consider the impacts from project-induced climate change, including on species assemblages and human pathogens through an increase in vector-conducive conditions (e.g., West Nile virus, avian flu).
- Consider the overall long-term health of San Diego Bay.
- Can the State Water Resources Control Board be included in long-range monitoring of these tidelands and water health?

- Consider the potential commercial and economic impact to the South Bay Salt Works.
- Consider catastrophic emergencies, such as massive flooding.
- Consider sea-level rise, and consider allowing for future maintenance needed to address sea-level rise.
- Consider a direct connection outflow from the Otay River to Pond 13 in case of high water volumes during a potential flood. This connection must be designed within Pond 13, as the levees of Ponds 22 and 23 cannot be breached, and there is no available space to widen the riverbed.
- Consider incorporating a community outreach component to communicate to the public the value of the restoration work that will be done and can be done in other areas.
- Consider any potential impacts on Pond 20.
- Consider one or more beneficial uses for the excavated materials.
- Consider removing contaminated soils.
- Consider providing for brine invertebrate production with restoration.
- Consider impacts to salt production.
- Consider using soils transported off the site as fill for the park site at 27th Street and Grove Avenue or to restore eelgrass habitat in Emory Cove.
- Address soil contamination if it exists.
- Consider including a long-range monitoring plan.

A list of the comments collected during and after the January 23, 2013 public scoping meetings and the public comment period~~s~~, as well as a list of the attendees at each meeting, is provided in Appendix ~~A~~B.

1.6.2 Distribution and Review of the EIS

From the beginning of the selection process through the distribution of the Draft EIS, every effort was made to provide the public with detailed information about the process and the alternatives to be evaluated. This EIS preparation process was formally initiated in November 2011 by publishing a Notice of Intent in the Federal Register. This notice included a project summary, background on the proposed action, a project description, and request for public comment associated with the proposed action.

In January 2013, an additional Notice of Intent was published in the Federal Register due to changes to the proposed action. This Notice of Intent also included a project summary, background on the proposed action, a project description, and request for public comment. In

January 2013, an additional scoping meeting was held, and included distribution of proposed action updates.

Throughout the process, the team distributed meeting notices and updates to federal, state, and local agencies; tribal governments; non-governmental organizations; and individual contacts. Chapter 7 of this document provides additional details regarding the public involvement process and outreach program that was implemented for this EIS. A listing of the public comments provided during the public review period for the draft EIS and the corresponding responses are provided in Appendix A.

1.7 AGENCY COORDINATION

Executive Order 12372, Intergovernmental Review of Federal Programs, requires that federal agencies provide opportunities for consultation to state and local governments that would be directly affected by a federal action. Coordination and consultation is ongoing with federal and state agencies, tribes, congressional representatives, and the local governments that surround the San Diego Bay NWR. These entities were also provided with copies of the EIS for review and comment. Letters were sent to Native American tribes on November 4, 2011, to notify and to solicit input on the proposed action.

The U.S. Army Corps of Engineers, based on its jurisdiction by law and special expertise pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), has agreed to participate as a cooperating agency.

1.8 RELATED PROJECTS

The following projects are related to the ORERP, as described below:

- **Carlsbad Desalination Plant –** The City of Carlsbad approved the Precise Development Plan and Desalination Plant in December 2005 (City of Carlsbad 2005). The Commission also conditionally approved the Carlsbad Desalination Plant in August 2008 (California Coastal Commission 2008). The ORERP is funded through a mitigation plan required by the Commission's conditional approval of the desalination plant project, as described in the MLMP, to address the impingement and entrainment impacts caused by the desalination plant's use of estuarine water.
- **Other projects in the South San Diego Bay Unit –** The San Diego Bay NWR CCP (USFWS 2006) describes several related projects that would occur in the vicinity of the proposed action, including wildlife and habitat management, habitat restoration, and modifications to additional adjacent salt ponds.
- **Port of San Diego Pond 20 located southwest of the ORERP –** The Port of San Diego owns the southern portion of Pond 20. Its portion of Pond 20 (approximately 95 acres) is

not part of the ORERP. The Port of San Diego's long-term plan for this site includes an 84-acre mitigation bank, a 3.1-acre commercial site (located on the western edge of Pond 20) intended to complement the new Bikeway Village project, and a 7.9-acre low-intensity commercial development (located on the eastern edge of Pond 20). In 2015, the Port of San Diego issued a Request for Proposal seeking a qualified entity to establish and operate a wetlands mitigation bank on the 84 acres.

- **South San Diego Bay Coastal Wetland Restoration and Enhancement Project –** This project encompasses three separate sites: 223 acres of salt ponds on the South San Diego Bay Unit of the San Diego Bay NWR, the 50-acre Chula Vista Wildlife Reserve, and the 25-acre Emory Cove site located along the western edge of San Diego Bay to the south of Coronado Cays. The construction process was completed in 2011, and post-construction monitoring is ongoing.
- **D Street Fill Project –** The D Street Fill Project restored 11.03 acres of tidally influenced coastal wetland habitat and 1.41 acres of upland habitat within a 12.44-acre area at the southeast corner of the D Street Fill, located to the west of Interstate 5 and south of the Sweetwater River flood control channel within the Sweetwater Marsh Unit of the San Diego Bay NWR, in Chula Vista. The project was implemented by the San Diego Gas & Electric Company (SDG&E) as mitigation for impacts associated with the relocation of an electrical substation. The material excavated from the restoration site was relocated to the northwest portion of the D Street Fill to raise the elevation of approximately 29.85 acres of land managed by the Service and Port of San Diego as a California least tern nesting site. Following completion of site excavation, the restoration site was planted with appropriate native vegetation. The 5-year monitoring and maintenance program will be implemented by SDG&E. The final Environmental Assessment for the project was completed in September 2015 (USFWS 2015).

1.9 DOCUMENTS INCORPORATED BY REFERENCE

The MLMP document requires Poseidon to submit a proposed mitigation site and preliminary restoration plan that, when implemented, will achieve the mitigation requirements outlined in Section 1.3. The ORERP was designed to fulfill the requirements, objectives, and restrictions outlined in the MLMP. Therefore, these aspects of the MLMP have been incorporated into this document by reference.

In addition to the MLMP requirements, the ORERP was designed to be consistent with the goals and objectives presented in the San Diego Bay NWR CCP. Therefore, the CCP and Final EIS and Record of Decision are incorporated by reference into this EIS, and, where appropriate, referenced sections have been summarized for the benefit of the reader.

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CHAPTER 2
ALTERNATIVES

2.1 OVERVIEW

Development and analysis of alternatives is an important step in the National Environmental Policy Act (NEPA) process. Alternatives are developed to identify and analyze different ways to achieve the purpose and objectives of the proposed action. The Council on Environmental Quality's NEPA regulations describe the alternatives section as the heart of an Environmental Impact Statement (EIS). Each of the alternatives analyzed should be reasonable and implementable, must be given equal treatment, and must provide a clear choice for the decision maker. Therefore, as outlined within this chapter, considerable effort was taken to develop a reasonable range of feasible alternatives. The no action alternative, which proposes no changes in the current management of the project site, serves as a baseline to which all other action alternatives are compared.

Consistent with the goals and objectives of the San Diego Bay National Wildlife Refuge (NWR) Comprehensive Conservation Plan (CCP) (USFWS 2006), the purpose of the Otay River Estuary Restoration Project (ORERP or proposed action) is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species, and to provide habitat for migratory seabirds and shorebirds as well as a range of salt marsh-dependent species. This project is also proposed to meet mitigation obligations required by Special Condition 8 of Coastal Development Permit E-06-013 for the construction and operation of a desalination facility in Carlsbad, San Diego County by Poseidon Resources (Channelside) LP (Poseidon). These requirements are set forth in the *Marine Life Mitigation Plan* (MLMP), approved by the Coastal Commission in August 2008 (Poseidon 2008). The two action alternatives present different approaches for restoring sensitive coastal habitat in accordance with the project's purpose and objectives as detailed in Section 1.4.2 of this EIS. Although both alternatives would be implemented within the same footprint, the alternatives differ in terms of the relative amounts of subtypes of coastal wetlands to be restored and enhanced, as well as the amount of excavation and fill that would be required to achieve the desired habitat types based on their tidal elevations. The document also addresses and analyzes a range of construction methods to implement the proposed restoration effort.

This chapter describes the process that was followed to identify the project site and the project alternatives. Three alternatives are analyzed in this document: the no action alternative (Alternative A) and two action alternatives (Alternative B and Alternative C). Additional alternatives that were considered but eliminated from detailed analysis are also described at the end of this chapter.

This EIS identifies Alternative B as the preferred alternative, due to increased habitat value and smaller excavation requirements; however, the alternative ultimately selected for implementation may be different. The selected alternative may include any one of the alternatives presented above, or it could include a combination of actions from the range of alternatives described in this EIS. ~~Such modifications may occur following completion of the EIS public review period based on the comments received from the public or other agencies.~~

2.2 ALTERNATIVES DEVELOPMENT PROCESS

As described in Section 1.3 of this EIS, Poseidon's Coastal Development Permit (No. E-06-013) was approved by the California Coastal Commission (Commission) in November 2007. Special Condition 8 of that permit required Poseidon to submit a MLMP addressing the impacts to marine organisms that would result from entrainment associated with the desalination facility's use of estuarine water. Following the Commission's approval of the MLMP in 2008, the Regional Water Quality Control Board (Regional Board) added a fish productivity requirement to the MLMP based on impingement of marine organisms. It is based on these actions that Poseidon was required to restore 66.4 acres of coastal wetlands as mitigation for impacts related to the operation of the desalination facility in Carlsbad (Poseidon 2008).

Before selecting the current project site, Poseidon conducted a comparison study of 15 sites in the Southern California Bight. Each site was evaluated to determine if restoration at the site would meet the terms and conditions of the MLMP. The following eight sites in San Diego County were considered: Loma Alta Slough in Oceanside; Buena Vista Lagoon, Agua Hedionda Lagoon, and Batiquitos Lagoon in Carlsbad; San Elijo Lagoon in Encinitas; the San Dieguito River Valley and Los Peñasquitos Lagoon in San Diego; and the Tijuana Estuary in the City of Imperial Beach. Additional sites considered outside San Diego County included Ormond Beach in Ventura County, the Los Cerritos and Ballona Wetlands in Los Angeles County, and the Huntington Beach Wetlands, Santa Ana River, and Anaheim Bay in Orange County. Several factors were considered in evaluating and comparing the sites, including opportunity for substantial tidal restoration for fish habitat, buffer and upland transition zone sufficient to protect restored areas, net increase in aggregate total wetland acreage, land availability, acreage availability, and possibility of timeline constraints.

Based on discussions with Commission staff, a Scientific Advisory Panel (SAP) formed by Coastal Commission staff to provide scientific expertise and representatives from other agencies, Poseidon ultimately determined that the Otay River Floodplain Site within the South San Diego Bay Unit of the San Diego Bay NWR was the most suitable mitigation site to fulfill the requirements, objectives, and restrictions outlined within the MLMP. In addition, the site has an existing conceptual restoration plan that has been described and analyzed by the U.S. Fish and Wildlife Service (USFWS or Service) in a programmatic EIS and Record of Decision prepared in conjunction with the San Diego Bay NWR CCP (USFWS 2006). Both the Commission (2011) and the Regional Board (2011) agreed with Poseidon's evaluation and approved the Otay River

Floodplain Site and preliminary restoration plan. The Service and Poseidon then entered into a Memorandum of Understanding to establish a restoration partnership.

Since November 2011, Poseidon's project team has worked in conjunction with the Service and members of the MLMP Workgroup (Commission, SAP, Regional Board, Port of San Diego, California Department of Fish and Wildlife, and California State Coastal Conservancy staff) on potential design alternatives to the originally proposed preliminary restoration plan (refer to Section 1.3).

Upon agreeing on a restoration site location, site analysis was initiated that included biological surveys, wetland jurisdictional delineations, tidal hydrology/hydraulics studies, soil characterization (e.g., contaminants testing, grain size analysis), flood and fluvial hydrology analysis, bathymetry and topographic studies, and a cultural resources inventory. In addition, earthwork calculations and cost estimates, an inundation/tidal habitat distribution study, and a fish productivity monitoring plan were prepared to assist in assessing preliminary restoration designs.

The Service, after considering the results of the soil characterization along with the volume of material that would be excavated to restore the wetland site, suggested that suitable material removed from the Otay River Floodplain Site could be put to beneficial use to restore a portion of the nearby salt ponds, as planned for in the CCP. Following discussions with the Commission and SAP, the MLMP Workgroup agreed that the proposed action would be revised to include the restoration of both the Otay River Floodplain Site and one or more of the salt ponds located north of the Otay River Floodplain Site. This decision led to the initiation of additional studies to determine which of the salt ponds would be best suited for the proposed restoration effort. Studies performed were similar to those undertaken when initially evaluating the Otay River Floodplain Site and included soils contaminants analyses, a fluvial hydraulics and sedimentation analysis, a tidal hydraulics analysis, an evaluation of levee stability, an evaluation of pre- and post-project habitat distribution to optimize habitat use by a variety of avifauna, and a salt marsh planting plan. After evaluation of the information gathered in these studies, it was determined that restoration of Pond 15, also located within the South San Diego Bay Unit of the San Diego Bay NWR, would be the best location to fulfill the requirements of the MLMP (in combination with restoration of the Otay River Floodplain Site) and support the goals of the CCP.

2.3 ALTERNATIVES EVALUATED IN DETAIL

2.3.1 Alternative A – No Action

Under the no action alternative, the Otay River Floodplain Site would not be restored or enhanced to support coastal wetlands; instead, the site would continue to support upland vegetation consisting mostly of exotic ruderal weed species and limited stands of coastal native scrub species, as well as a few small areas of jurisdictional wetland. The existing berms around the site would not be removed, and the existing hydrology within the floodplain would not be altered. Similarly, the Pond 15 Site would not be restored to tidally-influenced subtidal and intertidal habitat; it would remain as an active part of the existing commercial solar salt operation. Periodic maintenance and management of these areas by San Diego Bay NWR staff would continue in conjunction with ongoing management on the San Diego Bay NWR. This alternative represents the baseline from which other action alternative will be evaluated.

Both sites are, however, identified in the CCP as future wetland restoration sites; therefore, even under the no action alternative, one or both of these sites could eventually be restored or enhanced to achieve San Diego Bay NWR purposes (USFWS 2006).

2.3.2 Features Common to Both Action Alternatives

The following section describes the features common to both action alternatives (Alternative B and Alternative C). Both action alternatives were developed consistent with the goals and objectives of the San Diego Bay NWR CCP (USFWS 2006), as well as the terms and conditions of the permits issued by the Commission and Regional Board for the Carlsbad Desalination Project.

2.3.2.1 General Overview of Both Action Alternatives

Both action alternatives involve restoration within the 33.5-acre Otay River Floodplain Site and the 90.9-acre Pond 15 Site (see Figure 1-2), and implementation of a number of project features. All proposed project features associated with proposed action implementation are shown on Figure 2-1a. Each action alternative would have the identical construction footprint within the same two noncontiguous sites. Under either of the action alternatives, the existing conditions in the Pond 15 Site would be permanently altered as described in Sections 2.3.3 and 2.3.4. A portion of the excavated material from the Otay River Floodplain Site would be transported to the Pond 15 Site where existing elevations within the pond would be raised to support a range of intertidal habitats. Once the desired elevations are achieved within the Pond 15 Site, the outer levee would be breached to allow permanent tidal circulation within the pond. The breach would be approximately 200 feet wide. The primary difference between the two alternatives is the extent of excavation and fill required to achieve the specified wetland habitats.

Preparation of the Final Restoration Plan (FRP) is a requirement of the MLMP, which was adopted by the Commission in November 2008. The FRP focuses on the restoration design proposed by Poseidon and the Service of subtidal, intertidal mudflat, intertidal coastal salt marsh, and upland habitats. The EIS is structured such that implementation of the FRP can be achieved through either action alternative. Although the title “Final Restoration Plan” is provided as required by the MLMP, "final" does not imply that a restoration action alternative has been finalized at this time. ~~The FRP is included as Appendix C of this EIS.~~

The following elements would be implemented as part of the restoration of the Otay River Floodplain Site and the Pond 15 Site.

Southern Otay River Floodplain Levee Relocation: An existing levee along the southern bank of the Otay River was constructed decades ago as part of the original salt works operation to create a salt pond to the south of the Otay River. The pond has long since been eliminated from the primary solar salt operation to the north, but today this levee continues to separate tidal and fluvial water in the Otay River channel from the area to the south. The Port of San Diego owns the southern portion of this obsolete pond (often referred to as Pond 20), and the Service, through a lease with the California State Lands Commission, has management responsibility for the northern portion of the pond. To facilitate tidal exchange within the restored northern portion of the pond, the existing levee~~, extending~~ that extends along the southern edge of the Otay River channel from Nestor Creek southwest to the general location of the bridge that crosses the Otay River~~,~~ would be removed. However, to maintain current site conditions within that portion of the pond that is owned by the Port of San Diego, prior to the removal of the existing levee to the north, protections must be in place to prevent tidal and/or flood waters from entering the Port's property. As a result, the construction of a berm along the southern edge of the restored wetland was proposed. The locations of the existing levee to be removed and the new levee proposed for construction are shown in Figure 2-1a.

~~However, to maintain current site conditions within that portion of the pond that is owned by the Port of San Diego, a new levee would be constructed along the southern edge of the restored wetland prior to the removal of the existing levee along the southern bank of the Otay River. The location of this new levee is shown in Figure 2-1a.~~

Following the circulation of the draft EIS for public review, the Port of San Diego initiated efforts to establish a wetland mitigation bank in the remainder of the historical salt pond (referred to by the Port as Pond 20) located immediately to the south of the Otay River Floodplain Site. Should the wetland mitigation bank be implemented, a berm along the southern edge of the Otay River Floodplain Site would likely no longer be needed to keep protect the Port's property from inundation. Therefore, to keep all options open for the Port in developing their restoration design, the barrier installed between the two sites in association with the ORERP will be designed with the understanding that the barrier may be removed at some future date. This separation could consist of an earthen berm, as previously proposed, but could then be removed in association with restoration of the southern portion of the pond. Alternatively, a more temporary barrier could be installed. This barrier could consist of sandbags, sheet piling, water-filled cofferdams, or other comparable solutions, any of which would be removed from the site in association with the future restoration to the south.

Pond 13 and Pond 15 Levee Modification/Pond 14 and Pond 15 Levee Modification: To facilitate the dewatering of Pond 15, and to allow for full tidal restoration of the Pond 15 Site, modifications to the existing internal levees within Ponds 13, 14, and 15 would be required. These modifications would include adjusting the existing water flow connections between ponds to remove Pond 15 from the solar salt operation and establishing new connections to the system from primary Ponds 13 and 14 to the secondary pond system. This would be accomplished in part by closing the opening in the levee located between Ponds 14 and 15. This levee would then be reinforced ~~with excess fill material~~(in a manner that would not impact avian movement up or down the slope) to withstand potential erosive impacts associated with tidal fluctuation in Pond 15 following its connection to San Diego Bay. The levee ~~within the northern portion of~~ between Pond 15 and Pond 13 would ~~also~~ require similar reinforcement ~~and would remain separated from Pond 15.~~.

Pond 15 Levee Modification: Pond 15 will be hydraulically connected to ~~the~~ San Diego Bay through an opening created in the northern salt pond levee. At the proposed Pond 15 inlet/outlet location, the existing top of the levee is about 24 feet wide at a top elevation of approximately 7 feet NAVD 88 (North American Vertical Datum of 1988). The inlet/outlet would be constructed by breaching the levee and dredging/excavating approximately 9,000 cubic yards of material to create a channel with a bottom width of 160 feet and bottom elevation of -3.0 feet NAVD 88. The footprint of the inlet/outlet excavation area is approximately 1.74 acres. As shown on Figure 2-1b, an approximately 1.30-acre portion of the inlet/outlet excavation area located to the north of the existing Pond 15 levee is land managed by the San Diego Unified Port District (Port). Therefore, a Coastal Development Permit, Right-of-Entry Permit, long-term agreement, and other agreements or approvals must be obtained from the Port before the proposed excavation can occur. Approximately 4,300 cubic yards of cut would occur within the Port's jurisdiction. See Table 2-1 for details regarding inlet/outlet earthwork quantities within Service jurisdiction and Port jurisdiction.

Table 2-1
Pond 15 Inlet/Outlet Earthwork Quantities

Jurisdiction	Volume of Cut (cubic yards)	Area (acres)
U.S. Fish and Wildlife Service	4,700	0.44
Port of San Diego	4,300	1.30
Total	**9,000**	**1.74**

Source: Everest International Consultants 2016.

Breaching of the levee at Pond 15 would be conducted after all earthwork within Pond 15 is completed, except for a fill area in Pond 15 near the proposed inlet/outlet that would be reserved to receive the cut material from the levee breach. Excavation would likely be conducted from west progressing to east using land-based equipment such as a long-reach backhoe situated on the top of the levee on the east side of the proposed inlet/outlet area. Future maintenance of the inlet/outlet, if any, would be conducted in accordance with applicable Port permits and approvals.

2.3.2.2 Project Features

In addition to the noncontiguous Otay River Floodplain Site and Pond 15 Site, there are several additional project features required to facilitate restoration under both action alternatives as shown in Figure 2-1a. Several methods for transporting material from the Otay River Floodplain Site to the Pond 15 Site are evaluated in this document. Project features may vary depending upon the final method selected. ~~Three~~Two options for transporting material between the Otay River Floodplain Site and the Pond 15 Site are being considered including ~~pumping the slurried material through a pipeline,~~ using a conveyor belt~~,~~ (conveyor belt alignments are shown on Figure 2-4), or transporting the material via dump trucks that would follow the construction route illustrated in Figure 2-2. Potential impacts associated with implementation of these features are addressed in Chapter 4 of this document.

Project features associated with construction and material transport are outlined below:

Otay Channel Protection under Bikeway Bridge (Figure 2-1a, Project Feature 1): To protect the Otay River channel and western most Bayshore Bikeway bridge abutments from erosion, a layer of riprap would be placed at the bottom of the Otay River under the existing bridge just southwest of the Otay River Floodplain Site (Figure 2-1a). The area requiring protection is the bottom of the channel and the slope at the southern bridge abutment. The conceptual design of the riprap was estimated to have a footprint of approximately 5,500 square feet, and a fill volume of approximately 650 cubic yards.

Otay Channel Protection (Figure 2-1a, Project Feature 2): Protection of a portion of the bank that separates the Otay River from Pond 48 may be necessary to avoid bank erosion during the 100-year flood. Based on the 100-year flood velocities calculated for the project site from the preliminary construction drawings, a 1-foot layer of 5-inch rock extending approximately 1,100 long and approximately 60 feet wide would be sufficient to prevent erosion along the bank. Verification of the need for and extent of bank protection in this area would occur during the preparation of final construction plans. ~~The rock would be covered with soil and vegetated with appropriate native vegetation.~~

~~**Stockpiles (Figure 2-1a, Project Feature 3):** Two areas encompassing a total of 4.07 acres located in the northeastern portion of the Otay River Floodplain, to the east of Nestor Creek (Figure 2-1a),~~

~~would be set aside for stockpiling excavated material. During construction operations, all excavated material from the Otay River Floodplain Site would be either loaded directly onto the specific hauling method chosen or stockpiled east of Nestor Creek while waiting for transport to the fill area, as shown in Figure 2-3a, Staging Area and Stockpiles, and 2-3b, Proposed Stockpiles Details. Excess material, approximately 36,000 cubic yards of material depending on which action alternative is implemented, would remain in this area for an unspecified period of time after completion of construction. The material would be stored on the Refuge until it is needed to implement a future project or projects within the San Diego Bay NWR Complex. Reuse of the stockpiled material for uses other than the current project would require additional NEPA review.~~

~~As material is added to the stockpiles, it would be compacted and shaped using conventional earthmoving equipment to form two semi-rectangular piles each measuring about 500 feet long and about 200 feet wide, as shown in Figure 2-3b. The stockpiled soils would be watered during construction to minimize the potential for dust generation. The height of the piles would not exceed 8 feet, with a crest elevation of +18 feet NAVD 88. The side slopes would not exceed 4:1 (horizontal:vertical). Once all material is in place, the slopes and top would be hydroseeded with a native plant mix that would provide functional habitat, soil stability, and protection from wind and water-related erosion. Temporary and long-term erosion control measures (e.g., plastic sheeting, jute matting, straw wattles, fiber rolls) would be used to ensure effective protection until vegetation can grow to provide effective controls. These erosion control measures would be maintained until the stockpile material is removed.~~

Staging Area (Figure 2-1a, Project Feature 4): Implementation of the project would require a site where the logistics of mobilization and demobilization can occur, as well as where other project-related activities can be coordinated. Such a construction staging area would be prepared just to the east of Nestor Creek on the uplands portion of the Otay River Floodplain Site as shown on Figure 2-3 ~~3a~~. The existing non-native vegetation on the ~~6.06-acre~~ construction staging area site would be removed and the site surface would be enhanced with appropriate surface material (e.g., non-expansive soil, gravel) to accommodate vehicle movement and reduce the potential for wind and water erosion. The staging area would be located and designed to avoid adjacent wetland areas. The site would be fenced for security purposes and erosion control measures, such as fiber rolls and/or silt fencing, would be installed around the site to minimize the potential for runoff from the site to the adjacent wetland areas. A temporary electrical distribution line may be extended to the site to serve a temporary construction trailer, and portable toilets could be provided on site for construction workers. Space would also be provided for site workers to park during construction hours. Following completion of either of the action alternatives, the staging area would be restored to prior site conditions and revegetated with appropriate native plants, in accordance with the specification presented in Appendix D.

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 2-1a

Project Features

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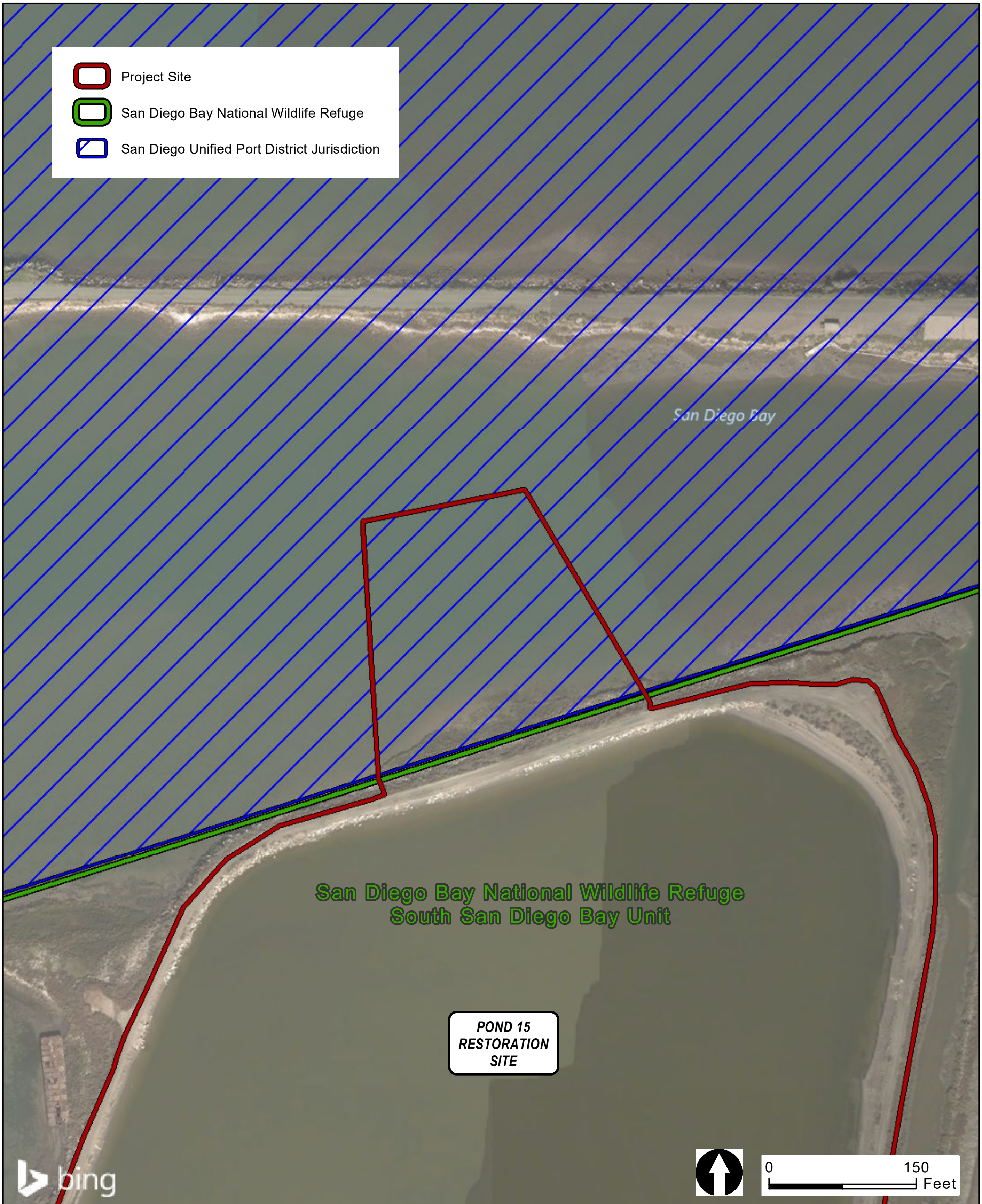

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 2-1b

Pond 15 Levee Jurisdiction

Otay River Estuary Restoration Project EIS

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SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2016

FIGURE 2-2
Truck Haul Route

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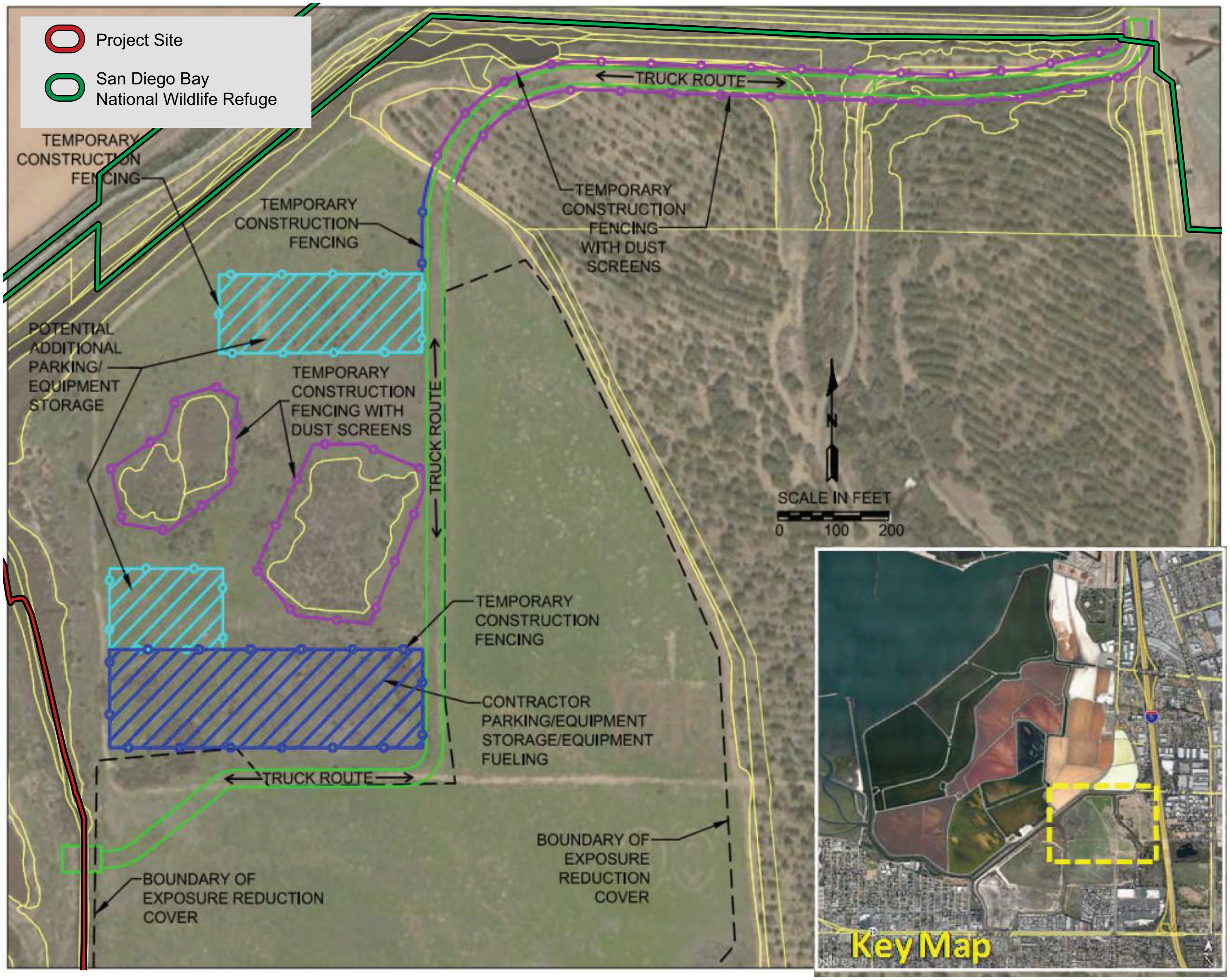

SOURCE: Everest International Consultants, Inc. 2017

FIGURE 2-3
Staging Area

Otay River Estuary Restoration Project EIS

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Crossing at Nestor Creek (Figure 2-1a, Project Feature 5): To access the western portion of the Otay River Floodplain Site from the staging area east of Nestor Creek, the contractor would install a temporary crossing, composed of fill material and associated culverts, across Nestor Creek. The temporary culvert to be installed would maintain a hydraulic connection to Nestor Creek. This crossing would be removed at the completion of construction, and the creek channel would be restored to its pre-project condition.~~ The temporary culvert would be installed that would maintain a hydraulic connection to Nestor Creek.~~

Construction Access Route from the Otay River Floodplain Site to Frontage Road (Figure 2-1a, Project Feature 6): This construction access route would be used under ~~any one~~either of the ~~three~~two construction material transfer alternatives to provide access to the site for construction equipment, materials, and site worker vehicles. Under the truck transport option, this route would also be used as the access route for transporting excavated material from the Otay River Floodplain Site to the Pond 15 Site. The need for traffic control along this route, particularly near the end of Main Street, would be coordinated with the appropriate agencies. Construction access onto the site would occur near the entry/exit point of the Bayshore Bikeway as it extends west towards Imperial Beach. Also in this location is the entry to the parking area for Swiss Park and the County of San Diego's Otay River Valley Regional Trail western trailhead. To manage traffic and bicycle flow in this area, traffic control would be provided at this intersection whenever construction access is occurring. **Crossing at Otay River (Figure 2-1a, Project Feature 7):** To access the construction staging area and western portion of the Otay River Floodplain Site from the end of Main Street, the contractor would install a temporary crossing at the Otay River channel. This crossing would be removed at the completion of construction; the river channel would be restored to pre-project conditions; and the site would be revegetated with appropriate native plants. In addition, at a separate location along the Otay River, as identified in Figure 2-4~~,~~ ~~and 2-5, both~~ the potential ~~pipeline and~~ conveyor belt routes would have to cross the Otay River. Upon removal of ~~any~~ the ~~pipeline or~~ conveyor belt, the river channel would be restored to pre-project conditions and revegetated with appropriate native plants.

Bike Path Reroute (Figure 2-1a, Project Feature 8): All construction-related access to the Otay River Floodplain Site would involve crossing a City of San Diego bike path that extends from Main Street in the north to the northern terminus of Saturn Boulevard in the south. The existing bike path would be temporarily rerouted during construction to minimize conflicts between bicyclists and construction vehicles and to ensure user safety. The temporary rerouting of this bike facility would require coordination with the City of San Diego and the County of San Diego since use of a portion of the existing Otay River Valley Regional Trail route would be needed to facilitate a reroute around the construction access point. A right-of-entry permit would also have to be obtained from the City of San Diego for any permanent or temporary upgrades to those portions of the trail that are located on City property. The specific alignment would be confirmed following finalization of construction planning. Preliminary design work indicates that the path could be temporarily routed around the eastern side of the Otay River Floodplain Site, through the Otay River Floodplain, as shown in Figure 2-1a. The rerouting of this path would likely require resurfacing, at least temporarily, to accommodate bicycles. Resurfacing could be provided as a permanent stabilized soil path that could appropriately accommodate all users on the Otay River Valley Regional Trail. Once construction has been completed, appropriate adjustments to the temporary routes would be coordinated with the City of San Diego and the County of San Diego to ensure suitable access along both the existing bike path and the regional trail is restored.

Construction Access Route from Bay Boulevard to the Pond 15 Site (Figure 2-1a, Project Feature 10): A designated construction access route is also needed to access the Pond 15 Site. Construction vehicles accessing this site from Bay Boulevard would enter the site via an existing access easement located east of Pond 29. At the southeast corner of Pond 29, vehicles would cross the Palomar Channel and then travel along the levee on the southern bank of the Palomar Channel towards Pond 15. As described below, a temporary crossing over Palomar Channel would be required. In addition, measures (such as the installation of a temporary open channel or pipes) would be taken in this area to ensure the continued flow of brine between salt ponds.

Crossing at Palomar Channel (Figure 2-1a, Project Feature 9): This crossing would be necessary to allow for construction access to the Pond 15 Site, and under the truck transport option, it would be needed to accommodate the transport of excavated material from the Otay River Floodplain Site to the Pond 15 Site. The temporary crossing would consist of fill material and associated culverts to ensure that the temporary crossing would not create impediments to water flow. The crossing must be able to support the weight of haul trucks across the Palomar Channel, directly east of the Pond 15 Site. The crossing would be removed at the completion of construction; the channel restored to its pre-project condition; and the area revegetated with appropriate native plants.

Pond 13 and Pond 14 Levee Modifications (Figure 2-1a, Project Features 11 and 12): Similar to levee modifications proposed between Ponds 13 and 15 and Ponds 14 and 15, as described previously, the internal levee between Ponds 13 and 14 would be modified to facilitate the dewatering of Pond 15, and to allow for full tidal restoration of the Pond 15 Site. These modifications would include adjusting the existing water flow connections between ponds to remove Pond 15 from the solar salt operation and establishing new connections to the system from primary Ponds 13 and 14 to the secondary pond system. This would be accomplished in part by closing the opening in the levee located between Ponds 13 and 14. This levee would then be reinforced (in a manner that would not impact avian movement up or down the slope) ~~with excess fill material~~ to withstand potential erosive impacts associated with tidal fluctuation in Pond 15 following its connection to San Diego Bay.

Raised Levee Between Pond 22 and Pond 23 (Figure 2-1a, Project Feature 13): The elevation of the levee that extends between Ponds 22 and 23 would be raised by 2 feet from an elevation of approximately 11 feet to 13 feet NAVD88. This action would require approximately 11,500 cubic yards of fill material and the typical side slope gradient for the modified levee would be 3:1 (horizontal:vertical). This improvement would take place during the final grading stage of construction. The levee, located northwest of the Otay River Floodplain Site, would be raised to avoid any effects associated with the project on downstream flooding during significant flood events. The results of the fluvial analysis indicated that raising the top of the levee between Ponds 22 and 23 by 2 feet, from an elevation of approximately 11 feet to 13 feet NAVD 88, would divert flood flows away from the Bayside Park area and toward the northern salt ponds. To avoid any increase in the maximum water elevation in the Bayside Park area during the 100-year flood, increasing the elevation of the levee between Ponds 22 and 23 by 2 feet has been included as a project feature. At this time it is assumed that suitable fill material for the levee modification would be available on site from project excavation material such that the import of suitable fill is not anticipated. Upon completion of the levee alterations, appropriate substrate would be added to the levee surface to support nesting birds and the side slopes will be constructed in a manner that will not impact avian movement up or down the slope.

Exposure Reduction Cover (Figure 2-1a, Project Feature 14): The excess material from the Otay River floodplain excavation site, which could involve up to 36,000 cubic yards of material depending on which action alternative is implemented, will be placed over an area east of Nestor Creek that contains elevated levels of contaminants, primarily DDT. This exposure reduction cover (ERC) would be between 1 foot to 1.5 feet in thickness and approximately 23.11 acres in area. The ERC and construction staging area to the north and west of the ERC would be revegetated with native species using locally obtained seeds following proper site compaction and completion of the proposed action. These sites will receive temporary irrigation to ensure the success of the revegetation effort.

~~**Revegetation Area (Figure 2-1a, Project Feature 14):** The 21.5-acre area east of Nestor Creek would be revegetated following completion of the proposed action. Two potential methods for revegetation are considered for this area: the first involves use of a custom seed mix, collected from the project area and tested for germination and purity; the second involves purchase of a premade Diegan coastal sage scrub seed mix from a commercial seed supplier.~~

~~Typically, for smaller scale revegetation projects, it is specified that all seeds~~ Seeds to be used for this revegetation effort would be collected from existing Diegan coastal sage scrub communities in the project area, in this case south San Diego Bay or nearby Tijuana River Valley. Using this method, ~~it is usually recommended that~~ all seed would be tested by a seed laboratory certified by the Association of Official Seed Analysts or a seed technologist certified by the Society of Commercial Seed Technologists as per the standards of the California Food and Agriculture Code for purity and germination.

~~Alternatively, seed companies offer pre-made coastal sage scrub mixes that have been collected in California but not necessarily in San Diego County or south San Diego Bay. Seeds have been tested in-house and are available at a set price per pound. The cost to apply the hydroseed mix and irrigate are the same for each option.~~

~~Under both options, the hydroseed~~The seed would be applied as slurry (hydroseed) to the entire surface area of the ~~disturbed portion of the~~ERC and the adjacent construction staging area. The hydroseed slurry would consist of the required seed species and quantities and an inert wood pulp matrix. Hydroseed would be applied as an even coating over all surfaces. ~~Potential~~Proposed plant pallets are provided in Appendix D, Planting Plan for Uplands.

The successful implementation of the planting plan for this area is likely to require some level of invasive plant control. Control will be implemented using an integrated pest management approach involving a combination of physical and chemical control, as described in Appendix D.

2.3.2.3 Sea-Level Rise

Based on general scientific agreement regarding impending climate change and subsequent sea-level rise, both action alternatives evaluate the impact of potential mean sea-level rise on proposed habitats. The California State Climate Action Team and Ocean Protection Council's Science Advisory Team guidance projects that increases in sea level will range from 4.68 inches to 24 inches by 2050 (State of California 2013; Commission 2015). In addition, in 2015, the Commission adopted a sea-level-rise policy guidance document using these same projections, further validating this approach (Commission 2015). Project analysis includes the associated shifts in inundation and habitat on the two restoration sites that would occur as a result of these sea-level rise projections on future site conditions.

2.3.2.4 Construction Methods

The construction methodology for implementing either of the action alternatives is addressed below and provided in detail within the 2016 report titled *Otay River Estuary Restoration Project Construction Methodology* by Everest International Consultants, which is included as Appendix E to this EIS.

SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2016

FIGURE 2-4
Conveyor Belt Haul Routes

Otay River Estuary Restoration Project EIS

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Implementation of either of the two action alternatives would require a substantial amount of earthwork, including the excavation (cut) of approximately 320,000 to 370,000 cubic yards of soil from the Otay River Floodplain Site. In both alternatives, the majority of this material would be transported to the Pond 15 Site to raise the elevations in the pond to levels suitable for supporting the desired intertidal wetland habitats and to reinforce levees in and around the Pond 15 Site. Additional material would be used to construct a new berm along the southern edge of the Otay River Floodplain Site. ~~Excess material would be stored to the east of the Otay River Floodplain Site (stockpiles) to be used on future NWR projects.~~

A description of the construction methods, equipment, and schedule is presented below. Minor revisions to the construction methodology could be proposed by the contractor selected for project construction with due consideration to the requirements specified in permits, agreements, and approval documents. If the selected contractor chooses a construction methodology that is substantially different from those described below and it is determined that the implementation of the new methodology would result in additional impacts on the human environment or the impacts would be different from those described in the Final EIS, new analysis of the potential impacts to the environment would be required and a supplement to the Final EIS would be prepared.

Construction Access

Heavy construction equipment would likely be trucked to the project sites via Main Street to access the Otay River Floodplain Site and via Palomar Street to Bay Boulevard to access the Pond 15 Site. Large and heavy equipment would be transported during off-peak traffic hours. Roads that could be used for construction access routes in the vicinity of the project site are shown in Figure 2-2, with the potential truck route outlined in Figure 2-1a. Major roads in the vicinity of the Otay River Floodplain Site include Main Street to the north of the Otay River Floodplain Site and Interstate 5 (I-5) to the east. Although unlikely, there is the potential that access from Saturn Boulevard to the south could be required for mobilization or demobilization of construction equipment. Major roads in the vicinity of the Pond 15 Site include Bay Boulevard, Palomar Street, and I-5 to the east. There are interchanges to I-5 at Palomar Street, Main Street, and Palm Avenue. The primary construction staging area would be located on the Otay River Floodplain Site to the east of Nestor Creek as described previously.

Using one of the I-5 interchanges, construction equipment would access the Otay River Floodplain Site at the northeastern corner of the Otay River Floodplain Site, where West Frontage Road, Main Street, and the Bayshore Bikeway intersect. Construction equipment would access the Pond 15 Site via a NWR access easement located off of Bay Boulevard just north of the intersection of Palomar Street and Bay Boulevard. To complete the construction work on the levee between Ponds 22 and 23, construction equipment would access the site via the main entrance to the South Bay Salt Works, located off Bay Boulevard.

Within the project sites, temporary dirt roads would be established to provide access for dump trucks and other construction equipment between the excavation, staging, and fill~~,~~ sites. ~~and stockpile areas.~~ For material transport, access routes would be established and maintained for public safety and environmental pollution control. To access the western portion of the Otay River Floodplain Site from the construction area, the contractor would install two temporary crossings across Nestor Creek and the Otay River, as described previously under "Project Features." In addition, construction vehicles transporting material from the Otay River Floodplain Site to the Pond 15 Site may use some of the existing salt pond levees. Since the existing levees were not initially built to accommodate heavy construction traffic, temporary road improvements such as widening to 30 feet and resurfacing and/or reinforcing with gravel/mats would likely be necessary.

Access to the site during construction would be controlled through the use of gates, fencing, and/or site security services. At the end of construction, and during the nesting season, all equipment would be demobilized. Due to the variety of nesting species using the site, the exact breeding season may vary from year to year.

Earthwork

The primary construction activity of the project is earthwork. The project requires the excavation of approximately 320,000 cubic yards of soil for Alternative B and 370,000 cubic yards of soil for Alternative C within the Otay River Floodplain Site. Between 50,000 to 60,000 cubic yards of soil would also be excavated from the Pond 15 Site. The majority of the soil excavated from both the Pond 15 Site and the Otay River Floodplain Site would be beneficially used as fill and cover within the Pond 15 Site, with some material disposed of on site as fill for use of dikes, levees, and upland habitat creation. After earthwork has been completed for the restoration sites, approximately 30,000 to 40,000 cubic yards of material would remain on site and would be used to create the ERC previously described. ~~stockpiled within the Otay River Floodplain portion of the San Diego Bay NWR (see Figures 2-1a, 2-3a, and 2-3b) for use on future NWR projects.~~

Prior to beginning site excavation, all areas to be graded would be cleared and grubbed with the resulting brush, trash, and debris disposed of at an approved off-site location. Once this step has been completed, excavation and transport of material would occur using some combination of trucks, bulldozers, loaders, and/or conveyor belts, ~~and/or pipelines~~ as described below.

1. ***Initial Excavation at the Otay River Floodplain Site:*** Land-based excavation would be conducted with a combination of bulldozers, front loaders, backhoes, graders, scrapers, excavators, and trucks. Bulldozers would be used to move excavated material to the

exposure reduction cover site. ~~stockpile areas, which may be necessary for staging before being transported to Pond 15.~~ Bulldozers may also be used to move material for on-site upland or berm construction.

2. ***Moving Fill from the Otay River Floodplain Site to the Pond 15 Site:*** One of the following methods would be used to move the excavated fill materials from the Otay River Floodplain Site to the Pond 15 Site. Under any of the following methods, the Pond 15 Site would need to be dewatered prior to material placement.

   a. Dump trucks (12-cubic-yard capacity) may be used to transport material from the Otay River Floodplain Site to the Pond 15 Site. As described previously, a system of haul roads and access points would need to be established and maintained. Dry material would be loaded onto trucks using a front loader or backhoe, or it would be excavated and hauled directly using scrapers. Wet material would be dried and then transported via trucks equipped with lining to retain water that remains in the soil. The anticipated truck route is shown in Figure 2-1a and 2-2.

      Truck traffic on this route would have some interference with the Bayshore Bikeway and City of San Diego bike path where the trucks enter and exit the Otay River Floodplain Site onto West Frontage Road. Traffic control, including a flagman, would be provided at this intersection to ensure public safety. From West Frontage Road, the trucks would turn onto Anita Street and then to Bay Boulevard. Trucks would enter the Pond 15 Site through the NWR access easement, as described previously. The salt pond levees used in the hauling operation would be improved and widened to 30 feet, using material excavated from the Otay River Floodplain Site, to allow for two-way traffic. The round trip distance of the truck route shown in Figure 2-2 is about 7 miles. A round trip, including loading and dumping, would likely take about 36 minutes. A contractor using 12-cubic-yard trucks would have to make about ~~43~~ 56,000 trips and ~~52~~ 67,000 trips, respectively, for Alternative B and Alternative C.

   b. Conveyor belts may be used to move excavated material within the Otay River Floodplain Site to the Pond 15 Site, as shown in Figure 2-4. The two possible routes for this long conveyor belt system, as shown in Figure 2-4, would be approximately 1.5 miles. The conveyor belt would be installed over the Otay River and under the existing Bayshore Bikeway. After crossing the Otay River and Bayshore Bikeway, the conveyor belt would continue northward, using the existing levees for support. One end of the conveyor belt would be near the Otay River Floodplain excavation site and the other end would dump either directly into the Pond 15 Site or into awaiting trucks in the Pond 15 Site, which would move the material a short distance within the pond. The conveyor belt system would be removed from the site prior to the nesting season and the levee tops would be restored to preconstruction conditions prior to each nesting season to accommodate nesting birds.

~~A pipeline may be used to transport material from the Otay River Floodplain Site to the Pond 15 Site. The two possible pipeline routes would run between 1.1 to 1.5 miles long, depending on the method chosen. As shown in Figure 2-5, the pipeline may be constructed using a direct route floating across the salt ponds (Option 1), or the pipeline may be routed along the existing levees (Option 2). In this construction method, excavated material from the Otay River Floodplain Site would be dumped into a pit, mixed with water taken from the Otay River to form a slurry, which would be pumped to Pond 15 through the pipeline. If the pipeline method were selected, the excavated material would arrive at the Pond 15 Site as a slurry mixture of water and soil. The material would be distributed through the pond by periodic relocation of the dredge pipeline discharge location. It is anticipated that it could take 1 to 5 years for the material to achieve a level of consolidation that would allow the safe use of land based equipment to distribute the material throughout the site to achieve the appropriate habitat types. Consequently, once all the material from the Otay River Floodplain Site has been pumped to the Pond 15 Site, the material would be left within the Pond 15 Site until final consolidation has been achieved. Additional equipment would be needed to conduct final grading operations in Pond 15 after enough consolidation has occurred to allow construction equipment to operate in this area.~~

3. ***Distribution of Fill and Final Grading in the Pond 15 Site:*** Distribution of fill material in the Pond 15 Site would be carried out with land-based equipment, such as bulldozers, scrapers, and/or long-reach backhoes. To avoid sinking in the wet, soft sediment, the bulldozers would initially push and spread the Otay River Floodplain Site fill material outward into the pond from the levees. The newly formed fill area extending from the levee would provide the working area for the trucks and bulldozers to reach farther into the pond. When the fill reaches the approximate finished ground elevations, construction equipment would be used to grade the site to the desired contours and slope variations. Such equipment may include land-based and/or amphibious construction equipment.

4. ***Final Grading:*** Final precise grading would be conducted in the Otay River Floodplain Site to achieve the final elevations of the appropriate habitat types in the excavated area. When the excavation reaches the approximate finished ground elevations, land-based equipment would be used to grade the site to the designed contours and slope variations. Final grading would include the removal of the southern levee of the Otay River within the Otay River Floodplain Site and construction of a new levee along the southern border of the restored wetland. These construction activities would be conducted with land-based equipment. At this time, it is assumed that suitable fill material for the levee construction would be available on site from excess project excavation materials.

Control of Fugitive Dust

To control fugitive dust during construction and truck transport of excavated material, the following procedures will be followed:

a. While material is being loaded into the trucks, the Contractor will perform dust suppression in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive.

b. After the excavated material is loaded into the transport trucks, it will be covered and otherwise contained while being transported to prevent material from blowing or spilling out of the truck during transport. For trucks traveling on public streets, prior to entering the public right-of-way each truck will be inspected to verify that the load is properly covered (tarped) and the truck is free of excessive dust and mud.

For moving excavated material from the floodplain to Pond 15 via conveyor belt, the following procedures will be followed:

a. While excavated material is being loaded onto the conveyor belt for transport to Pond 15, the Contractor will ensure that dust suppression is performed in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive.

b. During or after the excavated material is loaded onto the conveyor belt, the excavated material shall be sprayed with water to prevent material from blowing off the conveyor belt and if necessary, the material will be tarped to prevent dust emission and/or the spilling of excavated material from belt. Tarps or catchment aprons will be installed below the belt where it crosses the Otay River.

c. The process will be continually monitored to ensure that excavated material is not entering any water bodies, including the Otay River and nearby salt ponds. If necessary to protect water quality, additional measures will be implemented to minimize the loss of excavated material from the belt.

Dewatering Pond 15 Site

Dewatering would be necessary in the Pond 15 Site to ensure accuracy of fill placement. Due to the salinity of the water in the Pond 15 Site, the water is considered a valuable commodity to the South Bay Salt Works, but a pollutant to San Diego Bay. Therefore, water would be pumped from Pond 15 to Ponds 24 and 25, which are adjacent active salt ponds. To facilitate this, the dikes around Pond 15 would be modified to hydraulically isolate the Pond 15 Site from the rest of the salt pond system. Once isolated, the brine water remaining in the Pond 15 Site would be pumped into the active salt-producing salt ponds. The volume of water in the Pond 15 Site is estimated to be about 140 million gallons. Draining this volume of water into other salt ponds would take about a month using several heavy-duty water pumps (Appendix E). Therefore, dewatering of the Pond 15 Site would be one of the initial construction tasks. Dewatering would continue throughout construction to keep the Pond 15 Site dry. Any permits and/or approvals required to conduct the dewatering activities would be obtained prior to commencing this activity.

Areas Restored to Pre-Construction Conditions

Any areas that were bridged, reinforced, or widened to accommodate construction equipment would be restored to pre-construction conditions once construction is complete. Staging areas, access routes, and other disturbed areas would be decompacted and revegetated with appropriate native species, and, if necessary, recontoured to preconstruction conditions. Any temporary equipment, structures, or utilities (e.g., water, power) installed at the project site would be removed at the completion of construction. Temporary crossings would be removed and restored to pre-project conditions at the completion of construction. All salt pond levees disturbed by construction will be restored to conditions appropriate for accommodating salt works maintenance vehicles, where applicable, and for supporting seabird and shorebird nesting, as currently occurs on the site.

Erosion Control

Throughout construction, the contractor would be required to comply with National Pollutant Discharge Elimination System stormwater permit conditions, which require that a stormwater pollution prevention plan (SWPPP) be prepared and implemented by the contractor. The SWPPP identifies the best management practices to be implemented throughout construction to protect water and air quality, and other sensitive resources.

Construction Equipment

The types of equipment used to construct the project and the number of various pieces of equipment would ultimately be determined by the contractor during construction. A preliminary list of construction equipment was developed to provide the information needed to evaluate potential environmental impacts within this EIS. The type and number of major construction equipment used during construction are presented in Table 2-2.

Table 2-2
Construction Equipment Summary

Equipment	Fuel Type	Equipment Quantity per each Sediment Transport Option		
		Truck Haul	*Conveyor Belt Haul*	~~*Pipeline Haul*~~
Backhoe	Diesel	4	4	4
Loader	Diesel	4	4	4

Table 2-2
Construction Equipment Summary

Equipment	Fuel Type	Equipment Quantity per each Sediment Transport Option		
		Truck Haul	*Conveyor Belt Haul*	~~*Pipeline Haul*~~
Scraper	Diesel	4	4	~~4~~
Bulldozer	Diesel	4	4	~~4~~
Dump truck	Diesel	28	4	~~4~~
Water pumps[1]	Diesel	6	6	~~6~~
Booster pump	Diesel	—	1	~~1~~
Generator	Electric	—	1	~~1~~

Source: Appendix E.
1 Water pumps would only be needed for dewatering of Pond 15.

The fuel required for each type of construction equipment is also provided to allow evaluation of impacts to air quality and greenhouse gas emissions. ~~If the pipeline option is used to haul material from the Otay River Floodplain Site to the Pond 15 Site, then additional equipment would be needed to conduct final grading operations within the Pond 15 Site after enough consolidation has occurred to allow construction equipment to operate in the area.~~ It is anticipated that up to four bulldozers, four loaders, and four scrapers would be needed during the 4-month final grading operation that would occur between 2020 and 2024, as outlined in Table 2-~~3~~4.

Table 2-3
Preliminary Construction Schedule

Activity	Start ~~Date~~Date[1]	Finish Date	Duration
Mobilization	8/1/2017	9/30/2017	2 months
Dewatering of Pond 15	10/1/2017	11/1/2017	1 month
Earthwork	10/1/2017	1/31/2018	4 months
Seasonal demobilization	2/1/2018	2/28/2018	1 month
Core nesting season (no active construction)	3/1/2018	7/31/2018	5 months
Remobilization	8/1/2018	8/31/2018	1 month
Earthwork	9/1/2018	12/31/2018	4 months
Seasonal demobilization	1/1/2019	2/28/2019	2 months
Core nesting season (no active construction)	3/1/2019	7/31/2019	5 months
Remobilization	8/1/2019	8/31/2019	1 month
Pond 15 grading (Truck/Conveyor options)	9/1/2019	12/31/2019	4 months
~~Pond 15 grading (Slurry option - early estimate)[1]~~	~~9/1/2020~~	~~12/31/2020~~	~~4 months~~
~~Pond 15 grading (Slurry option - late estimate)[1]~~	~~9/1/2024~~	~~12/31/2024~~	~~4 months~~

Note:
~~1 Dates are associated with the slurry construction method only, with an estimated delay due to the consolidation of material.~~
1 The analysis assumes a construction start date of August 2017, which represents the earliest date construction was anticipated to be initiated. Construction would most likely begin in mid-2018. However, assuming the earliest start date for construction represents the worst-case scenario for criteria air pollutants and GHG emissions because equipment and vehicle emission factors for later years would be slightly

less due to more stringent standards for in-use off-road equipment and heavy duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years.

Construction Schedule

Construction activities would occur in the following general order, with an approximate start date in August 2017 (see footnote to Table 2-3 above) and estimated completion date between December 2020 and December 2024, as shown in Table 2-3, depending on the construction method chosen:

- Dewatering of the Pond 15 Site would be initiated at the start of construction as soon as the dewatering equipment is mobilized and brought to the Pond 15 Site. The Pond 15 Site would be hydraulically isolated from the rest of the salt pond system, and the approximately 140 million gallons of isolated brine water would be pumped into the adjacent active salt-producing salt ponds.
- Other mobilization and staging area set up would follow. The access/truck route would be created within the Otay River Floodplain Site and strengthened and widened, if necessary, within the salt pond access roads and the Pond 15 Site. Conveyor belts would be installed, if applicable. The Otay River Floodplain Site would then be cleared and grubbed to begin excavation. Excavation and placement of excavated materials would occur simultaneously; otherwise, excavated material would be temporarily stockpiled while waiting for transport to the fill area.
- Excavation of the Otay River Floodplain Site and placement of fill in the Pond 15 Site would then occur, followed by final grading of both sites. Earthwork operations would generally occur within the timeframe of ~~August 1 to February 28~~ September 30 to February 15, to avoid disturbance during the avian nesting season. Mobilization and demobilization of construction equipment to and from the site may occur outside this timeframe if it is determined that the areas to be affected do not support nesting birds.
- At the completion of construction in the Otay River Floodplain Site, a new levee would be constructed along the southern edge of the restored floodplain to prevent the flow of tidal waters onto the adjacent property. The levee between Pond 22 and Pond 23 would be modified simultaneously with the construction of the new levee on the Otay River Floodplain Site. Once this new levee and existing levee have been completed, the existing levee between the Otay River Floodplain Site and Otay River would be removed.
- ~~Planting~~Restoration planting would begin when earthwork is complete within the Otay River Floodplain Site and the Pond 15 Site. A detailed planting program FRP is outlined below. Planted areas would be monitored and maintained until performance standards specified in the MLMP are achieved. Hydroseeding of the exposure reduction cover would

occur following final compaction of the proposed fill and the planted area would be monitored and maintained in accordance with the specification included in Appendix D.

Construction Coordination and Restrictions

Construction activities may impact the operation of the South Bay Salt Works due to the conveyor belt, ~~pipeline,~~ and construction-related traffic. Coordination with the South Bay Salt Works operators would occur during the final design and prior to commencement of construction activities.

Construction activities would be limited to within the hours of 7 a.m. and 7 p.m. Monday through Saturday (excluding holidays) in accordance with Section 59.5.0404 of the City of San Diego Municipal Code. Work would not occur on holidays due to local jurisdiction restrictions. In addition, construction activities would be scheduled around the core bird nesting season.

For the purpose of assessing environmental impacts, a preliminary construction schedule was developed for the proposed action based on the assumptions and information above. The schedule, presented in Table 2-~~3~~4, is based on hauling the excavated material to the Pond 15 Site via truck and/or conveyor belt. ~~If the pipeline method, which would transport slurried material from the Otay River Floodplain Site to the Pond 15 Site is employed, an additional 1 to 5 years may be needed to complete the construction operation.~~

2.3.2.5 Wetland Planting Program

The planting program would be implemented under either of the action alternatives to meet the overall goal of creating self-sustaining intertidal wetlands and to achieve the mitigation requirements described in the MLMP~~.~~ (also see Section 2.3.2.2, Revegetation Area). MLMP performance standards that relate to vegetation within the wetland portion of the mitigation site include:

1. **Vegetation.** The proportion of total vegetation cover and open space in the marsh shall be similar to those proportions found in reference sites. The percent cover of algae shall be similar to percent cover found in reference sites.
2. **Spartina Canopy Architecture.** The restored wetland shall have a canopy architecture that is similar to the reference sites, with an equivalent proportion of stems over 3 feet tall.
3. **Reproductive Success.** Certain plant species, as specified in the work program, shall have demonstrated reproduction (i.e., seed set) at least once every 3 years.
4. **Exotics.** The important functions of the wetland shall not be impaired by exotic species.

Implementation would involve three types of wetland habitats: low, mid, and high marsh. In addition, transition zone, high tide refugia, and upland habitats are proposed since the main focus of the project is to return regular diurnal tidal flushing to both the Otay River Floodplain Site and the Pond 15 Site within the San Diego Bay NWR. Transition zones, based on the elevation, would ~~not~~ be considered wetland habitat for the purposes of determining compliance with the MLMP. Performance standards for the revegetation areas are outlined within the FRP for the Otay River Estuary Restoration Project (Appendix ~~J~~C of the draft EIS).

Transitional areas and high tide refugia will support native high salt marsh vegetation species, including Parish's glasswort (*Arthrocnemum subterminale*), Boxthorn (*Lycium californicum*) and fourwing salt-bush (*Atriplex canescens*) among others. Those plant species that remain emergent during extreme tides will continue to provide cover for the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*) until the extreme high tides recede. These plants will also provide potential nesting habitat for rails and the State endangered Belding's Savannah sparrow (*Passerculus sandwichensis beldingi).*

To ensure adequate establishment and balanced representation of each species within each habitat, plantings would occur in groupings. The proposed salt marsh restoration would be achieved by grading (Otay River Floodplain Site) or filling (the Pond 15 Site) the project sites to elevations that are inundated by diurnal tides. Although much of both sites would receive the necessary water for plant growth through this tidal influence, the ~~upland~~ transition zone would be less influenced by tides, and supplemental watering would be required. Irrigation in these areas would be provided by either a temporary overhead irrigation system or pressurized water truck, or a combination of both.

For the Pond 15 Site, installation of a temporary irrigation system may not be compatible with ongoing salt operations. An irrigation system/water truck would be used to provide supplemental water to the restoration sites until plantings have become established. Irrigation would be phased out gradually depending on the local weather conditions during the establishment period (e.g., usually after the first one or two growing seasons). Irrigation of the site would be necessary until the plants are determined to be self-sufficient.

2.3.3 Alternative B

Alternative B represents the preferred alternative, the alternative that the Service proposes to implement. However, a final decision by the Service on which alternative will be selected will be presented in the Record of Decision. ~~occur following consideration of the comments received during the public comment period for the Draft EIS.~~

Alternative B would involve lowering the elevation and contouring the Otay River Floodplain Site to create tidally influenced habitat. The proposed site condition would consist of approximately 5.0~~1~~ acres (15%) of intertidal mudflat, 24.6 acres (73%) of intertidal salt marsh habitat through altering elevations on the site, 0.1 acres of transitional habitat, and 3.7 ~~3.9~~ acres

(~~12~~ 11%) of upland habitat, as shown on Figure 2-5a ~~6a~~. Species and propagation method are described in Table 2-4.

Table 2-4
Species Composition and Recommended
Propagation Method for Salt Marsh and Transition Zone Habitats

Habitat Type	Common Name	Scientific Name	Propagation Method	Spacing on Center
Low salt marsh	California cordgrass	*Spartina foliosa*	Plugs	6 feet
Mid-salt marsh	Saltwort Salt marsh daisy Sea blite	*Batis maritima* *Jaumea carnosa* *Suaeda esteroa*	Cuttings in rose pots Cuttings in rose pots Cuttings in rose pots	6 feet
High salt marsh	Saltgrass Alkali heath Shoregrass Parish's pickleweed Sea lavender	*Distichlis spicata* *Frankenia salina* *Monanthochloe littoralis* *Arthrocnemum subterminale* *Limonium californicum*	Cuttings in rose pots Cuttings in rose pots Cuttings in rose pots Seed in rose pots Cuttings in rose pots	6 feet
Transition zone	Alkali weed Boxthorn Shoregrass Parish's pickleweed Palmer's frankenia	*Cressa truxillensis* *Lycium californicum* *Monanthochloe littoralis* *Arthrocnemum subterminale* *Frankenia palmeri*	Seed in rose pots Cuttings in rose pots Cuttings in rose pots Seed in rose pots Cuttings in rose pots	6 feet

~~**Source:** Appendix JC.~~

Alternative B would also involve raising the elevation and contouring the Pond 15 Site to create approximately 10.4 ~~10.3~~ acres (11%) of subtidal channel, 18.4 ~~18.5~~ acres (20%) of intertidal mudflat, 56.7 ~~55.8~~ acres (62%) of intertidal salt marsh habitat, 0.6 acres (1%) of transitional habitat, 1.0 acre (1%) of high tide refugia, and 3.9 ~~6.3~~ acres (~~7~~ 4%) of upland habitat, as shown on Figure 2-~~6b~~5b and described in Table 2-5. Native wetland plant species would be installed at appropriate elevations within each site to assist in the establishment of low marsh, mid marsh, and high marsh vegetative communities. Native upland habitat would also be restored as appropriate within the site, as illustrated on Figure 2-~~6a~~5a and Figure 2-~~6b.~~5b.

Table 2-5
Alternative B (Intertidal) Restoration Vegetation Communities at Project Completion

Proposed Vegetation Community	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	~~0.00~~—	10.36 ~~27~~
Mudflat – frequently flooded	4.37 ~~4.26~~	16.42 ~~18~~
Mudflat – frequently exposed	0.68 ~~0.79~~	1.95 ~~2.36~~
Low salt marsh	8.96 ~~8.88~~	15.57 ~~15.58~~
Mid salt marsh	11.62 ~~11.71~~	34.88
High salt marsh	3.99 ~~3.97~~	6.24 ~~5.37~~
Transitional	0.15	0.63

Table 2-5
Alternative B (Intertidal) Restoration Vegetation Communities at Project Completion

Proposed Vegetation Community	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
*Total Created Wetland Habitat**	*29.77* ~~*29.61*~~	*86.06* ~~*84.65*~~
High Tide Refugia	—	0.96
Upland habitat	3.74 ~~3.89~~	3.88 ~~6.26~~
Total*	**33.51**	**90.90**

Source: Appendix J.
* Acreage may not total due to rounding.

The combination of the wetlands created at the Otay River Floodplain Site and the Pond 15 Site under Alternative B is intended to provide sufficient mitigation credit to meet the MLMP requirements.

Implementation of Alternative B would require the excavation of approximately 320,000 cubic yards of soil at the Otay River Floodplain Site to lower the elevation and achieve the contours required to establish ~~a subtidal~~ tidal wetlands on the site (refer to Figure 2-~~6a~~5a). Approximately 260,000 cubic yards of the excavated soil would be beneficially used as fill and cover within the Pond 15 Site to raise the ground to elevations suitable to support coastal salt marsh habitat ~~and nesting areas~~ (refer to Figure 2-~~6b~~5b). The excavated material would also be used as fill for dikes~~,~~ and levees~~, and upland habitat creation.~~. The remainder of the material (approximately 30,000 to 40,000 cubic yards) would be used for the exposure reduction cover. The soil would be used to cover contaminated soils located to the east of the Otay River Floodplain site. ~~stockpiled on the northeastern portion of the Otay River Floodplain Site (refer to Figures 2-1a and 2-3a).~~ Under the truck construction method option, approximately 56,000 truck trips would be necessary to deliver the soils from the Otay River Floodplain Site to the Pond 15 Site, assuming each truck moves approximately 12 cubic yards of material.

This restoration alternative factors in the potential for a 4.68- to 24-inch sea-level rise by 2050. Figures 2-~~6c~~5c and 2-~~6d~~5d illustrate the change in habitat types on the Otay River Floodplain Site from 2020 to 2050. Figures 2-~~6e~~5e and 2-~~6f~~5f illustrate the change in habitat types on the Pond 15 Site from 2020 to 2050. Figures 2-~~6c~~5c through 2-~~6f~~5f represent vegetation communities at each site following the most conservative projection of 24 inches of sea-level rise. The specific acreages associated with the maximum projected 24 inches of sea-level rise are outlined in Table 2-6 for the Otay River Floodplain Site and Table 2-7 for the Pond 15 Site.

Table 2-6
Alternative B (Intertidal) 24-Inch Sea-Level Rise Variation: Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	—	3.94
Mudflat, frequently flooded	4.37 ~~4.26~~	11.56 ~~14.01~~
Mudflat, frequently exposed	0.68 ~~0.79~~	1.96 ~~2.59~~
Low salt marsh	8.96 ~~8.88~~	8.49 ~~9.81~~
Mid salt marsh	11.62 ~~11.71~~	3.87 ~~3.51~~
High salt marsh	3.99 ~~3.97~~	0.32 ~~0.25~~
Transitional	0.15	0.15
*Total Created Wetland Habitat**	*29.77* ~~*29.61*~~	*30.29* ~~*30.17*~~
Upland habitat	3.74 ~~89~~	3.22 ~~3.34~~
Total*	**33.51**	**33.51**

Source: Appendix J.
* Acreage may not total due to rounding.

Table 2-7
Alternative B (Intertidal) 24-Inch Sea-Level Rise Variation: Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	10.36 ~~10.27~~	6.58 1~~4.20~~
Mudflat, frequently flooded	16.42 ~~16.18~~	28.94 ~~27.56~~
Mudflat, frequently exposed	1.95 ~~2.36~~	3.54 ~~4.33~~
Low salt marsh	15.57 ~~15.58~~	30.12 ~~32.45~~
Mid salt marsh	34.88	7.82 ~~7.54~~
High salt marsh	6.24 ~~5.37~~	1.99 ~~2.25~~
Transitional	0.63	1.91
*Total Created Wetland Habitat**	*86.06* ~~*84.65*~~	*90.90* ~~*88.32*~~
High Tide Refugia	0.96	—
Upland habitat	3.88 ~~6.26~~	—~~2.58~~
Total*	**90.90**	**90.90**

Source: Appendix J.
* Acreage may not total due to rounding.

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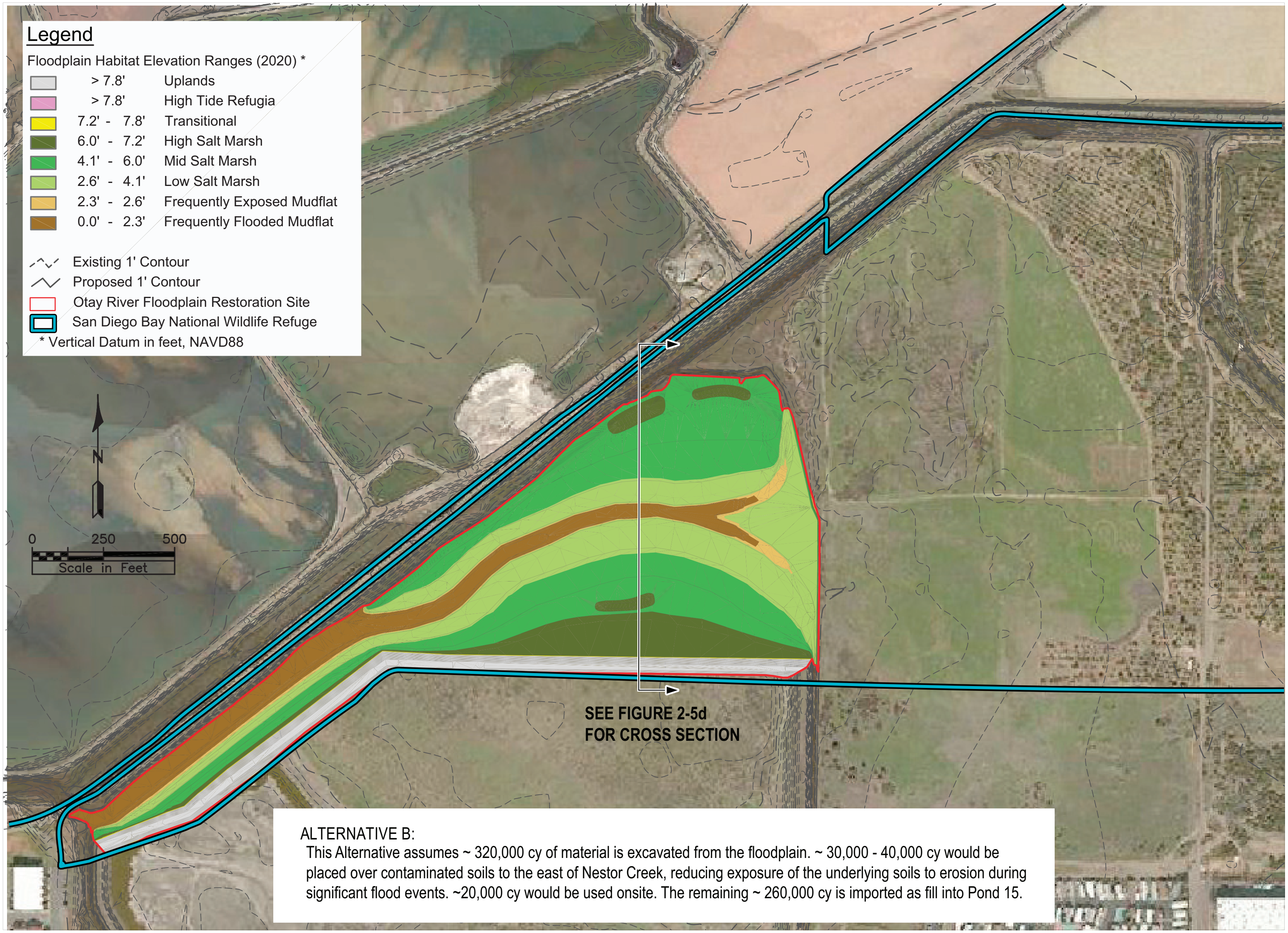

SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-5a

Alternative B - Intertidal Alternative, Otay River Site Plan

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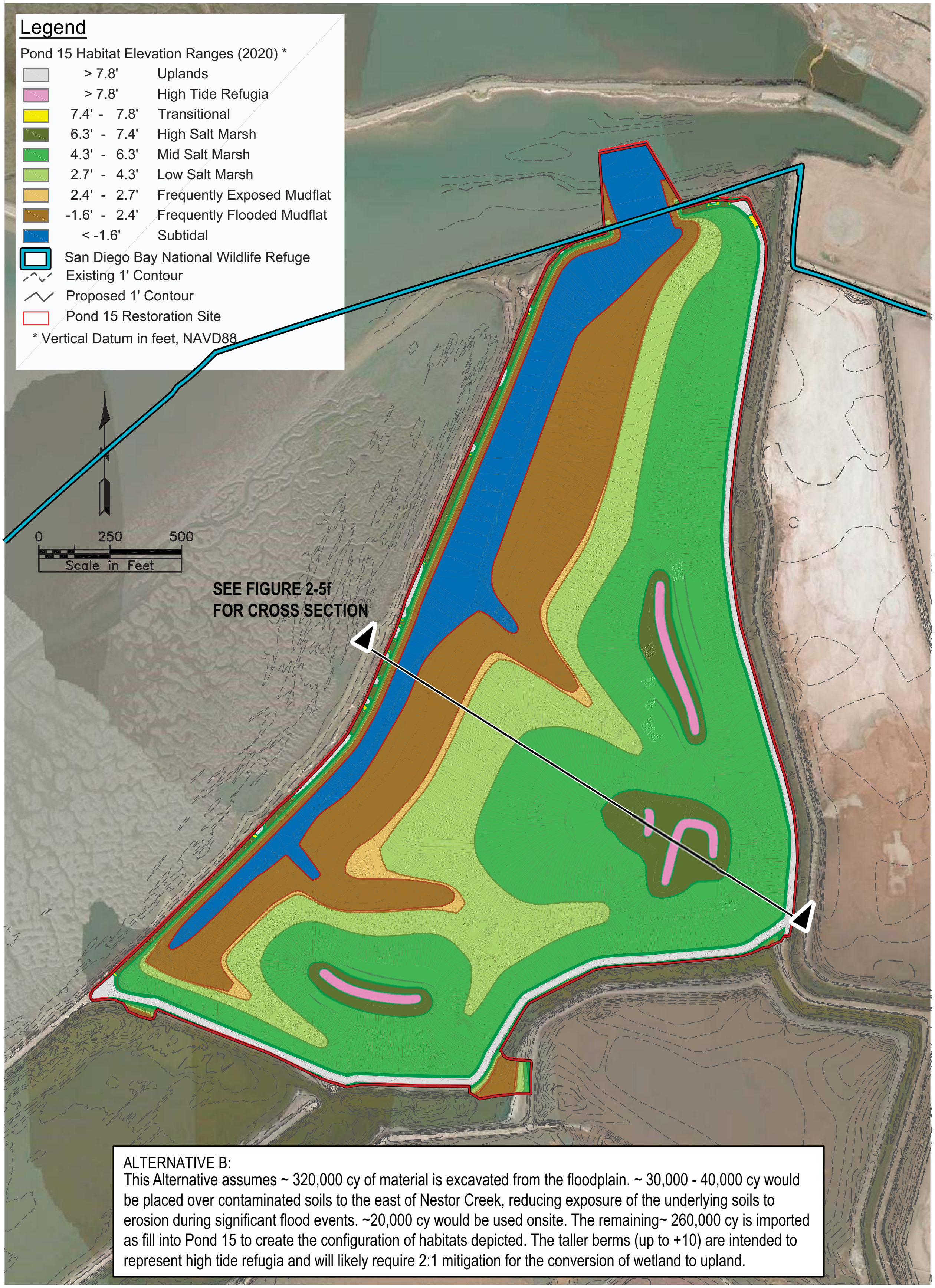

SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-5b

Alternative B - Intertidal Alternative, Pond 15 Site Plan

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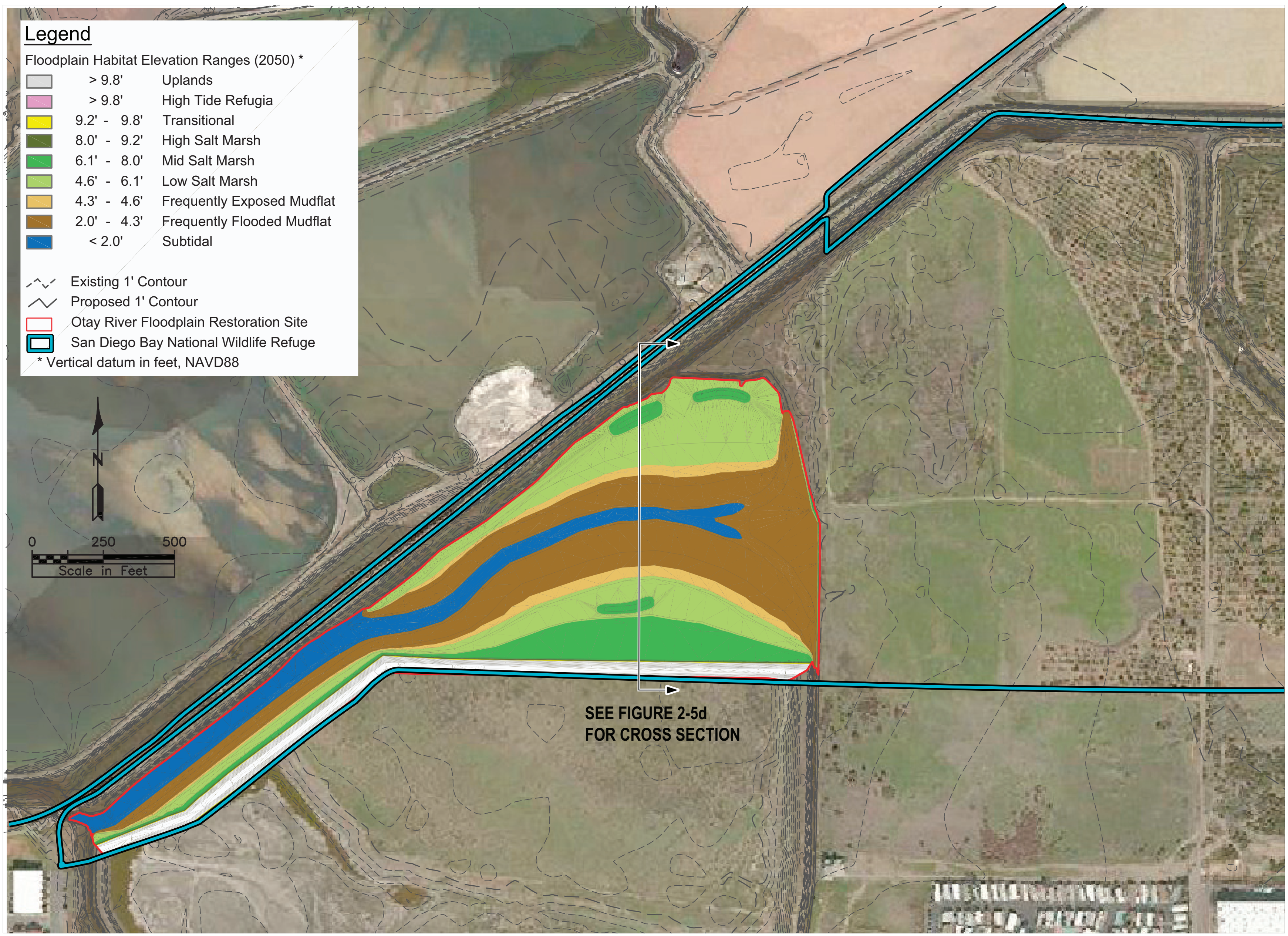

SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-5c

Alternative B - Intertidal Alternative, Projected 24" Sea-Level Rise, Otay River Site Plan

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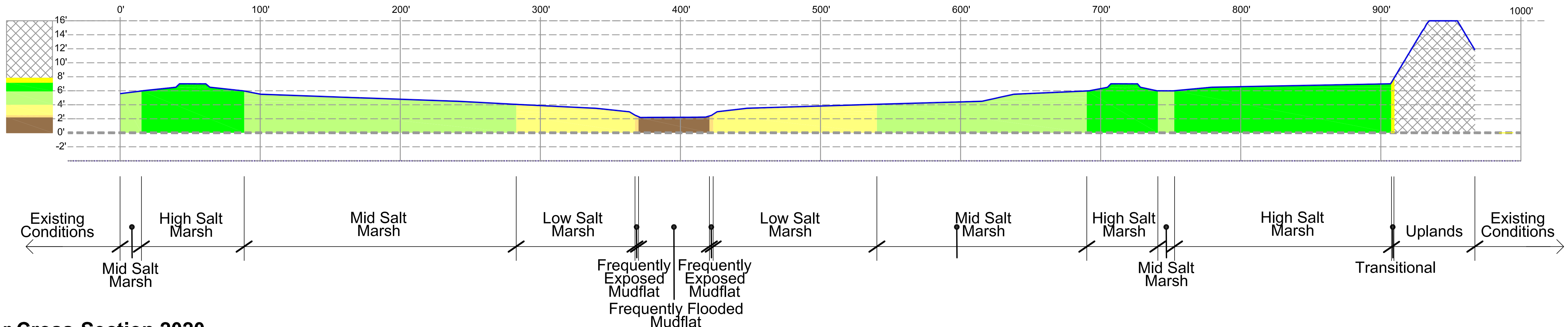
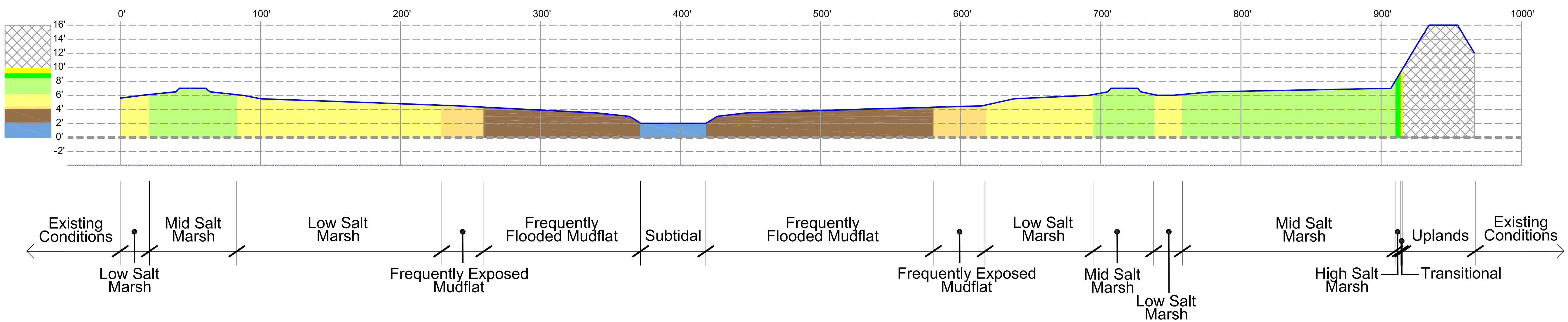
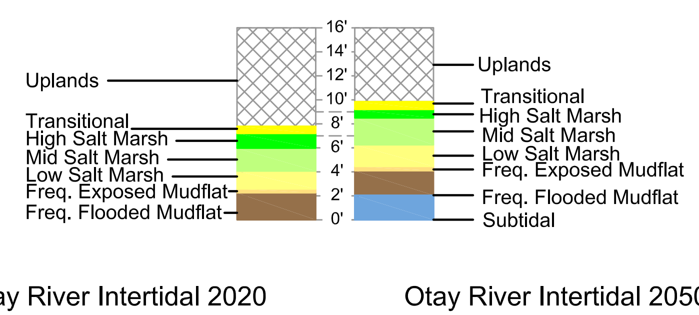


Otay River Cross-Section 2020



Otay River Cross-Section with 24" Projected Sea-Level Rise (2050)



Habitat Elevation Comparison between 2020 and 2050

VERTICAL SCALE 5x HORIZONTAL SCALE

NOTE:
This cross section is for illustrative purposes only, and not for construction.

FIGURE 2-5d

Alternative B - Intertidal Alternative, Otay River Cross-Sections: 2020 and Projected 24" Sea-Level Rise (2050)

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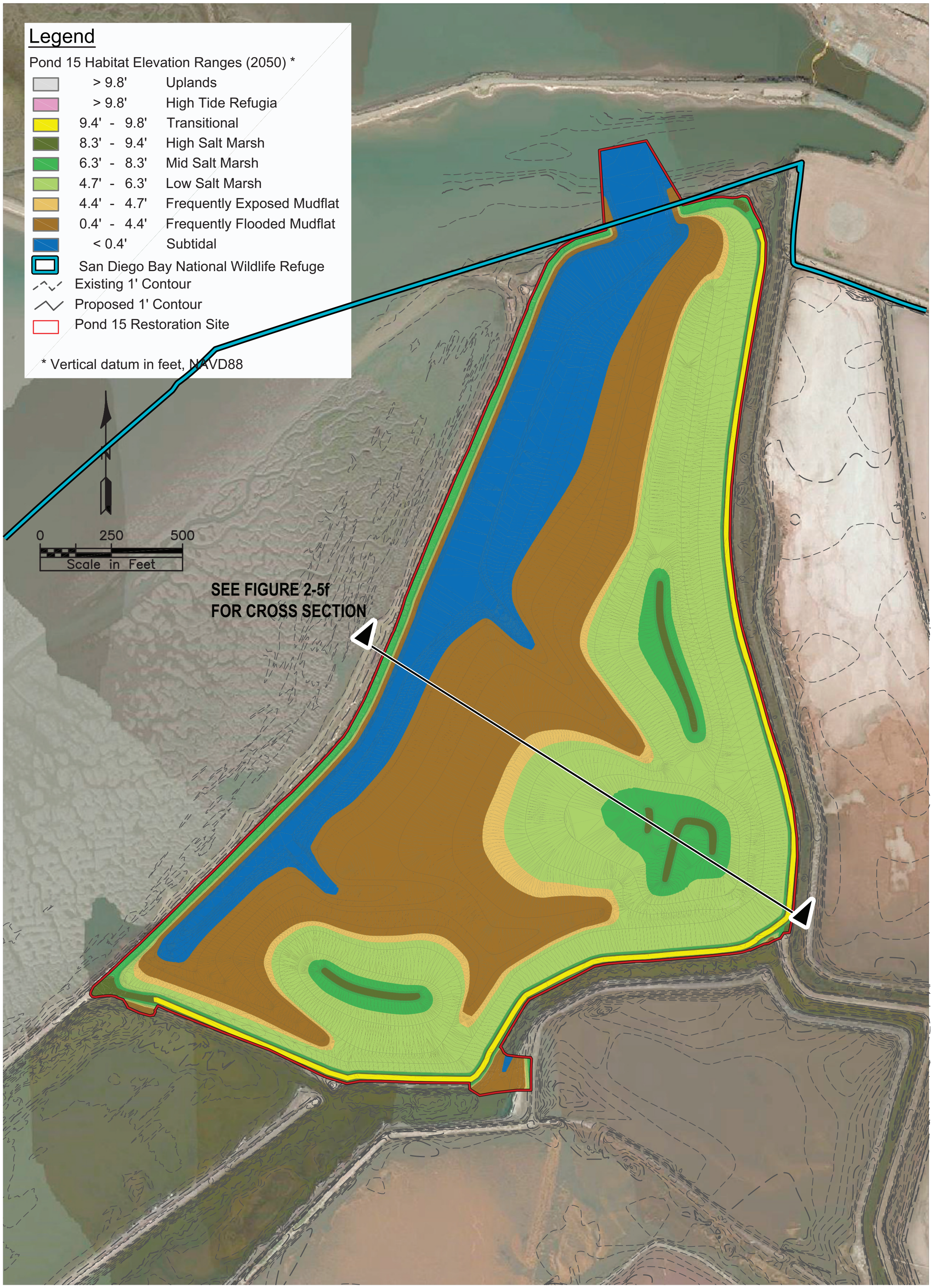

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SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-5e

Alternative B - Intertidal Alternative, Projected 24" Sea-Level Rise, Pond 15 Site Plan

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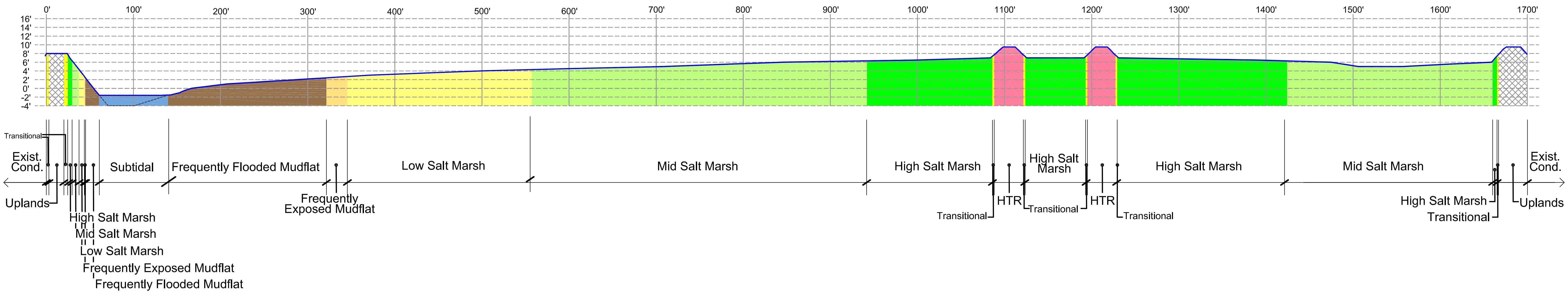
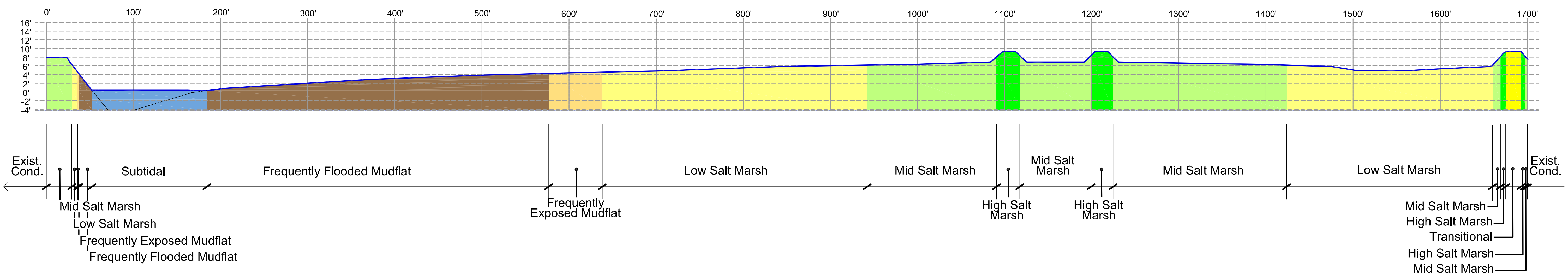
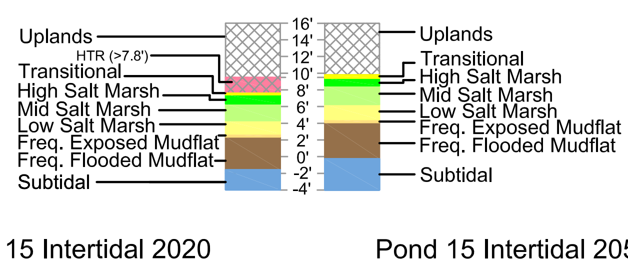


Pond 15 Cross-Section 2020



Pond 15 Cross-Section with 24" Projected Sea-Level Rise (2050)



Habitat Elevation Comparison between 2020 and 2050

NOTE:
This cross section is for illustrative purposes only, and not for construction.

VERTICAL SCALE 5x HORIZONTAL SCALE

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FIGURE 2-5f

Alternative B - Intertidal Alternative, Pond 15 Cross-Sections: 2020 and Projected 24" Sea-Level Rise (2050)

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2.3.4 Alternative C

Alternative C would involve altering the Otay River Floodplain Site and Pond 15 Site to create a subtidal channel within the Otay River Floodplain Site. Under Alternative C, the subtidal zone would be surrounded by mudflat and increasing elevations of salt marsh. Specifically, Alternative C would involve lowering the elevation and contouring the Otay River Floodplain Site to create approximately 4.5 acres (13% ~~14%~~) of subtidal channel, approximately 6.5 ~~6.4~~ acres (20% ~~19%~~) of intertidal mudflat, 18.4 ~~18.5~~ acres (55%) of intertidal salt marsh mudflat, 0.4 acres (1%) of transitional habitat, and 3.7 ~~4.1~~ acres (11 ~~12~~%) of upland habitat, as shown on Figure 2-~~7a~~6a and described in Table 2-8.

Alternative C would also involve raising the elevation and contouring the Pond 15 Site to create approximately 9.8 ~~10.2~~ acres (11%) of subtidal channel, 16.3 ~~18.3~~ acres (18% ~~20%~~) of intertidal mudflat, 57.8 ~~54.6~~ acres (64% ~~60%~~) of intertidal salt marsh, 0.9 acres (1%) of transitional habitat, 2.2 acres (2%) of high tide refugia, and 4.0~~7.85~~ (4% ~~9%~~) of upland habitat as shown on Figure 2-~~7b~~6b and described in Table 2-8. Both sites would be planted with an appropriate mix of native plants that would mature into low marsh, mid marsh, and high marsh vegetative communities. Native upland habitat would also be restored as appropriate within the site, as shown on Figures 2-~~7a~~6a and 2-~~7b~~6b. The subtidal areas would provide fish spawning and foraging habitat, and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish during high tides.

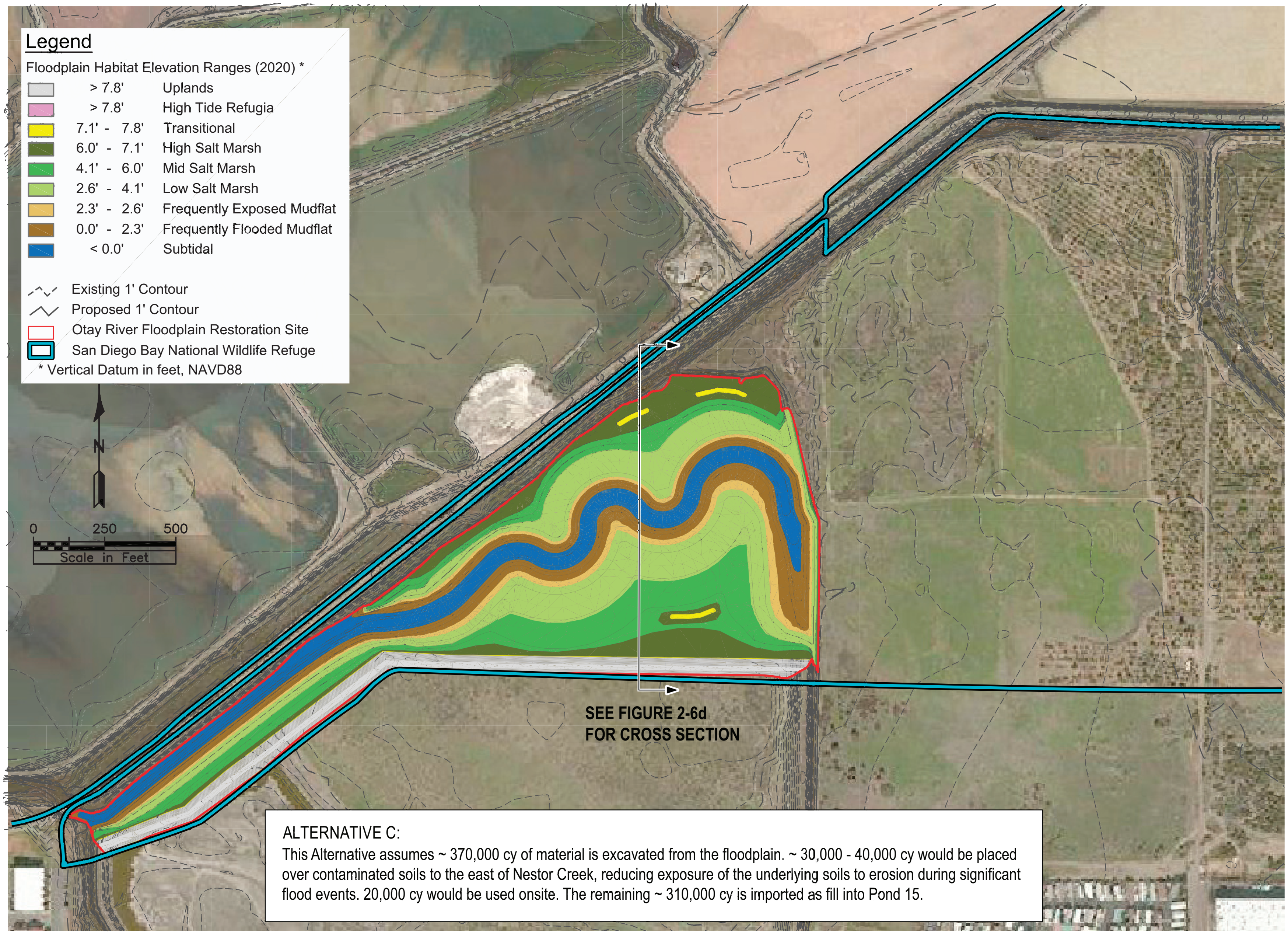
Table 2-8
Alternative C (Subtidal) Restoration Vegetation Communities at Project Completion

Proposed Vegetation Community	Otay River Floodplain Site Acres	Pond 15 Site Acres
Subtidal	4.48	9.81 ~~10.23~~
Mudflat, frequently flooded	4.75 ~~4.43~~	14.90 ~~16.11~~
Mudflat, frequently exposed	1.78 ~~2.00~~	1.36 ~~2.16~~
Low salt marsh	8.28 ~~8.34~~	11.92 ~~12.11~~
Mid salt marsh	6.17 ~~6.21~~	33.34 ~~28.06~~
High salt marsh	3.95 ~~3.94~~	12.56 ~~14.39~~
Transitional	0.35	0.89
*Total Created Wetland Habitat**	*2.977* ~~*2.941*~~	*84.79* ~~*83.06*~~
High Tide Refugia	—	2.15
Upland habitat	3.74 ~~4.10~~	3.96 ~~7.85~~
Total*	**33.51**	**90.90**

Source: Appendix J.
* Acreage may not total due to rounding.

The combination of the wetlands created at the Otay River Floodplain Site and Pond 15 Site under Alternative C would also be expected to provide sufficient mitigation credit to meet the MLMP requirements.

Implementation of Alternative C would require excavation of approximately 370,000 cubic yards of soils at the Otay River Floodplain Site to alter the elevation and achieve the contours required to establish a subtidal wetland on the site (refer to Figure 2-~~7a~~6a). In addition, between 50,000 and 60,000 cubic yards of soil would be excavated from Pond 15. This material must be excavated to create the appropriate habitat types and transfer material to throughout the Pond 15 Site. Approximately 310,000 cubic yards of the excavated soil would be beneficially used as fill and cover within Pond 15 to raise the ground to elevations suitable to support coastal salt marsh habitat~~ and nesting areas.~~. The excavated material would also be disposed of on site as fill for dikes~~,~~ and levees~~, and upland habitat creation.~~. The remainder of the material (approximately 30,000 to 40,000 cubic yards) would be used to cover contaminated soils located to the east of the Otay River Floodplain Site. ~~stockpiled within the northeastern portion of the Otay River Floodplain Site (refer to Figures 2-1a and 2-3a)~~. Under the truck construction method option, approximately ~~52~~ 67,000 total truck trips would be necessary to deliver the soils from the Otay River Floodplain Site to the Pond 15 Site, assuming each truck moves approximately 12 cubic yards of material.



SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-6a

Alternative C - Subtidal Alternative, Otay River Site Plan

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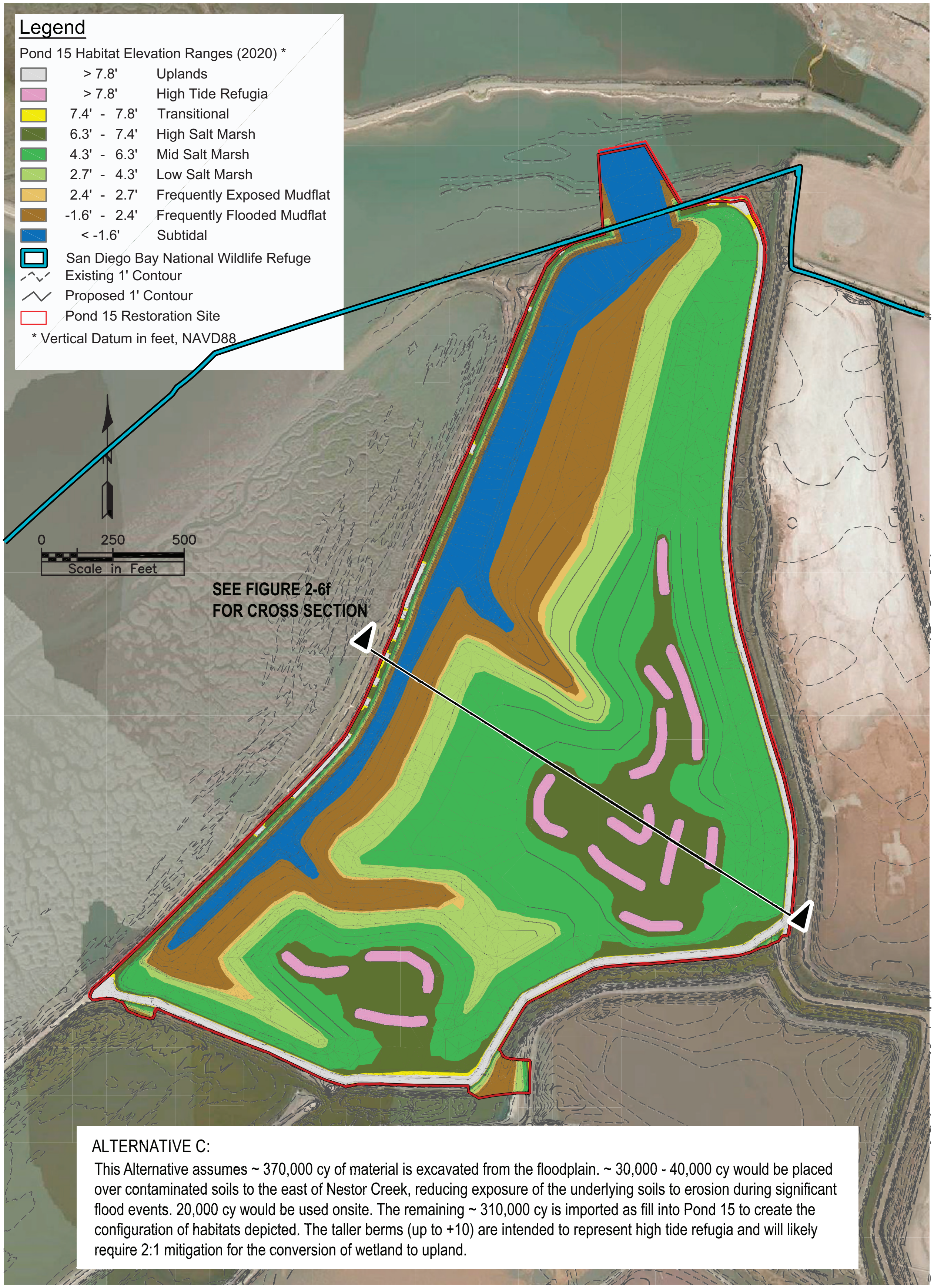

ALTERNATIVE C:

This Alternative assumes ~ 370,000 cy of material is excavated from the floodplain. ~ 30,000 - 40,000 cy would be placed over contaminated soils to the east of Nestor Creek, reducing exposure of the underlying soils to erosion during significant flood events. 20,000 cy would be used onsite. The remaining ~ 310,000 cy is imported as fill into Pond 15 to create the configuration of habitats depicted. The taller berms (up to +10) are intended to represent high tide refugia and will likely require 2:1 mitigation for the conversion of wetland to upland.

SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-6b

Alternative C - Subtidal Alternative, Pond 15 Site Plan

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This restoration alternative factors in the potential of a 4.68- to 24-inch rise in sea level by 2050 (State of California 2013; Commission 2015). Figures 2-~~7c~~6c and 2-~~7d~~6d illustrate the change in habitat types from 2020 to 2050 at the Otay River Floodplain Site. Figures 2-~~7e~~6e and 2-~~7f~~6f illustrate the change in habitat types from 2020 to 2050 at the Pond 15 Site. Figures 2-~~7c~~6c through 2-~~7f~~6f represent vegetation communities at each site following the most conservative projection of 24 inches of sea level rise. The specific acreages associated with the maximum projected 24 inches of sea-level rise are outlined in Table 2-9 for the Otay River Floodplain Site and Table 2-10 for the Pond 15 Site.

Table 2-9
Alternative C (Subtidal) 24-inch Sea-Level Rise Variation: Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	4.48 ~~4.48~~	7.29 ~~4.48~~
Mudflat, frequently flooded	4.75 ~~4.43~~	12.87 ~~15.04~~
Mudflat, frequently exposed	1.78 ~~2.00~~	1.28 ~~1.48~~
Low salt marsh	8.28 ~~8.34~~	5.61 ~~6.96~~
Mid salt marsh	6.17 ~~6.21~~	2.77 ~~1.99~~
High salt marsh	3.95 ~~3.94~~	0.28 ~~0.36~~
Transitional	0.35	0.18
*Total Created Wetland Habitat**	*29.77* ~~*29.41*~~	*30.28* ~~*30.31*~~
High Tide Refugia	—	—
Upland habitat	3.74 ~~4.10~~	3.22 ~~3.20~~
Total*	**33.51**	**33.51**

Source: Appendix J.
* Acreage may not total due to rounding.

Table 2-10
Alternative C (Subtidal) Sea-Level Rise Variation: Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	9.81 ~~10.23~~	16.06 ~~14.40~~
Mudflat, frequently flooded	14.90 ~~16.11~~	22.73 ~~24.95~~
Mudflat, frequently exposed	1.36 ~~2.16~~	2.94 ~~2.76~~
Low salt marsh	11.92 ~~12.11~~	29.61 ~~25.78~~
Mid salt marsh	33.34 ~~28.06~~	14.70 ~~17.31~~
High salt marsh	12.56 ~~14.39~~	2.96 ~~3.08~~
Transitional	0.89	1.91
*Total Created Wetland Habitat**	*84.79* ~~*83.06*~~	*90.90* ~~*88.28*~~
High Tide Refugia	2.15	—
Upland habitat	3.96 ~~7.85~~	—~~2.63~~
Total*	**90.90**	**90.90**

Source: Appendix J.
* Acreage may not total due to rounding.

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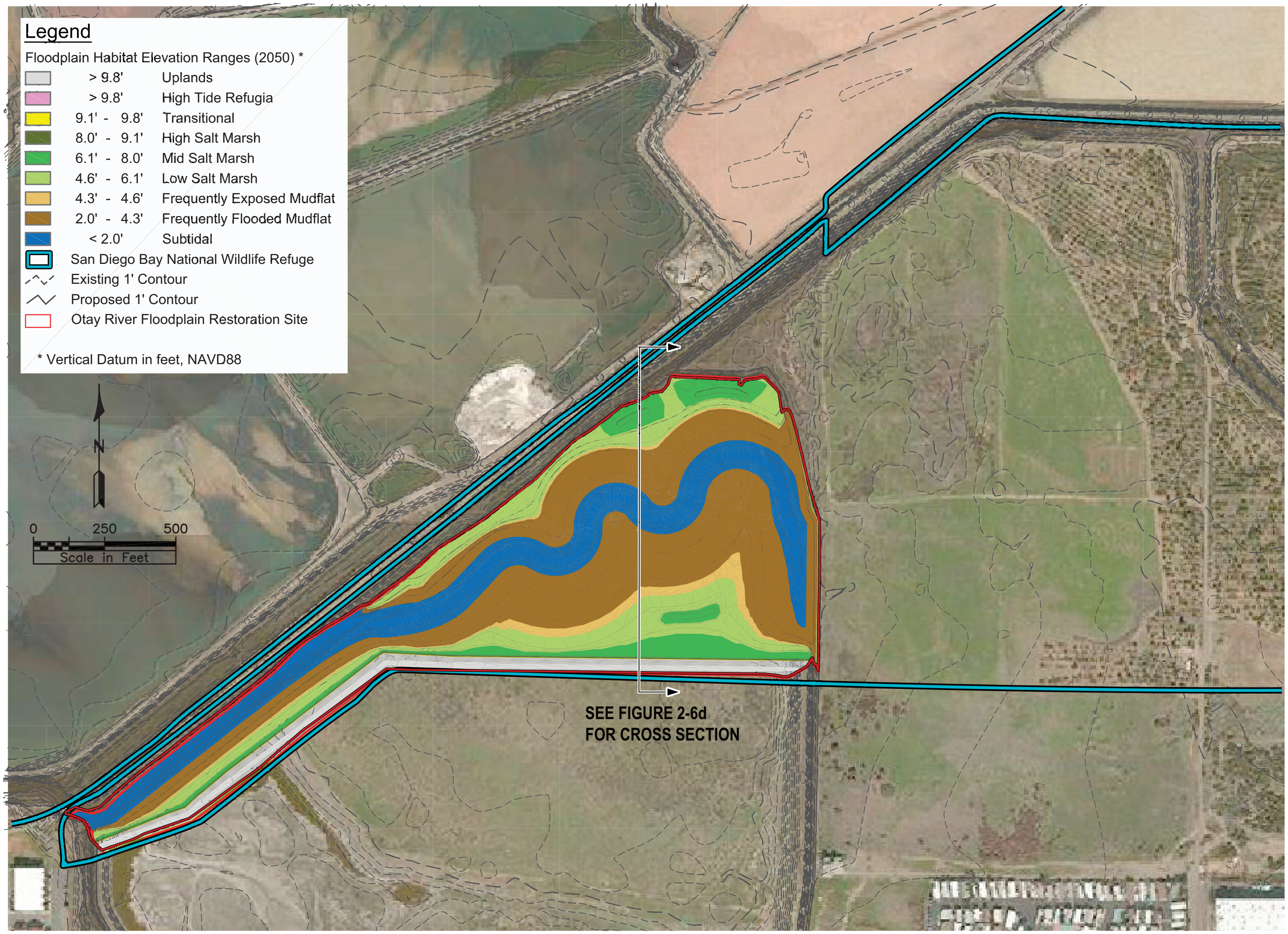

SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-6c

Alternative C - Subtidal Alternative, Projected 24" Sea-Level Rise, Otay River Site Plan

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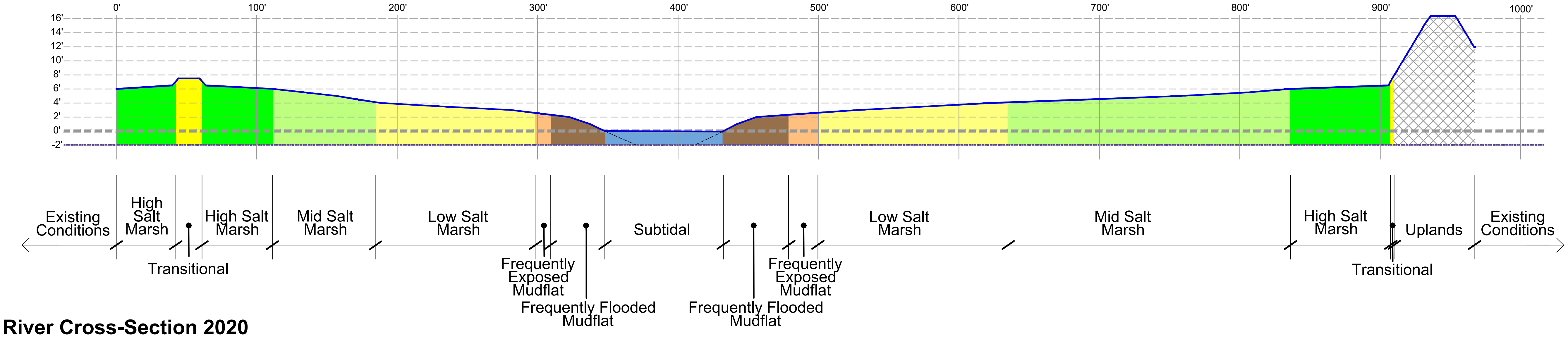
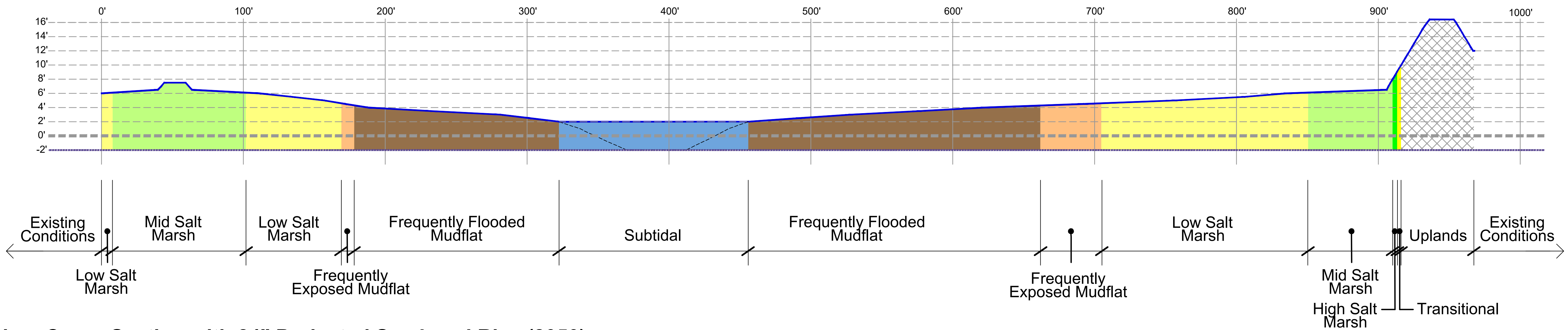
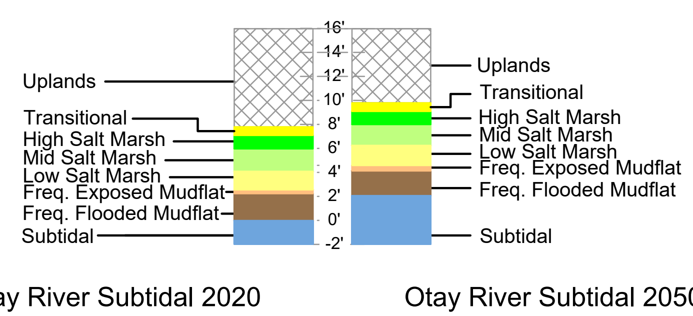


Otay River Cross-Section 2020



Otay River Cross-Section with 24" Projected Sea-Level Rise (2050)



Habitat Elevation Comparison between 2020 and 2050

VERTICAL SCALE 5x HORIZONTAL SCALE

NOTE:
This cross section is for illustrative purposes only, and not for construction.

FIGURE 2-6d

Alternative C -Subtidal Alternative, Otay River Cross-Sections: 2020 and Projected 24" Sea-Level Rise (2050)

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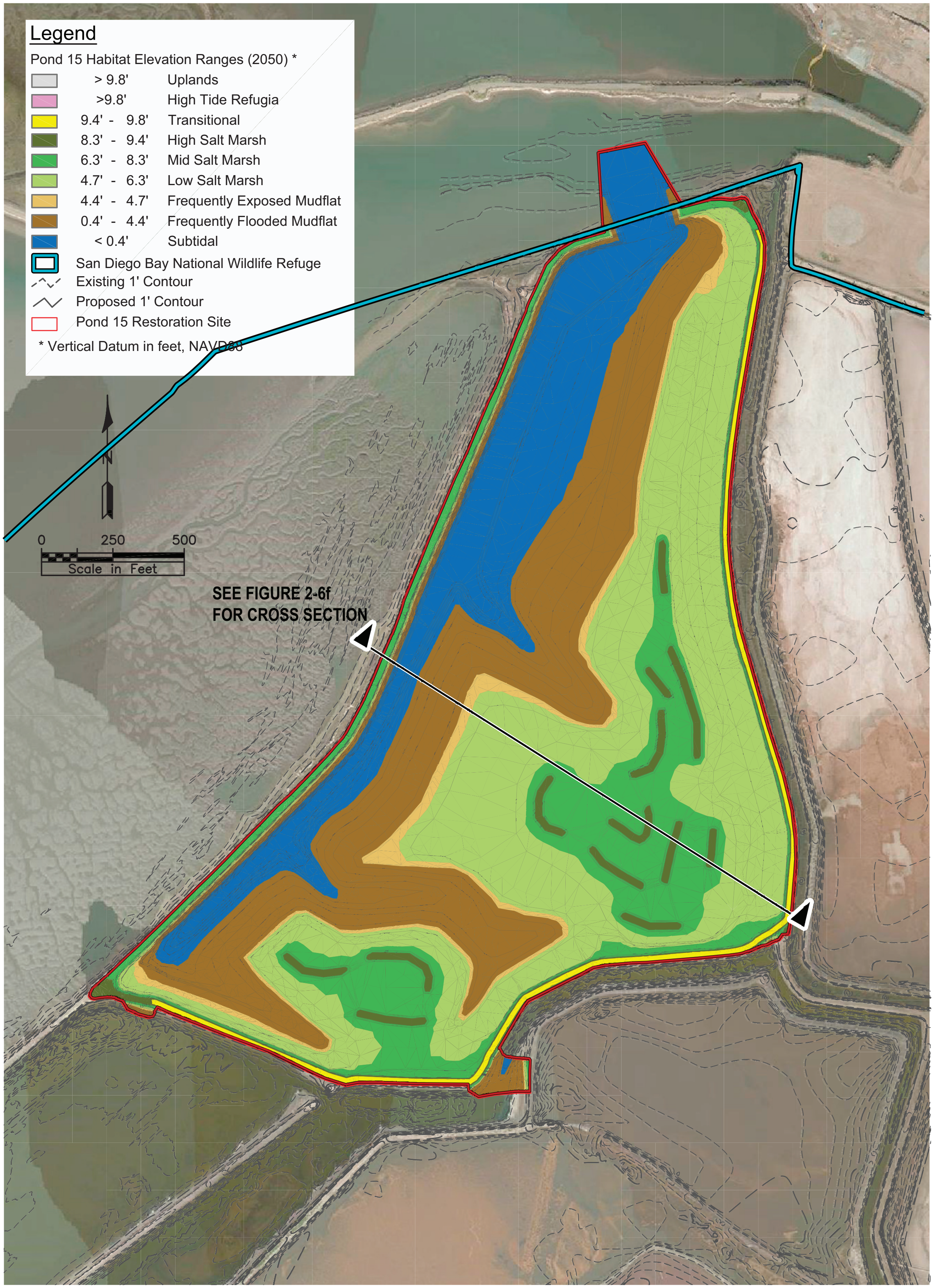

SOURCE: Everest International Consultants, Inc. 2018

FIGURE 2-6e

Alternative C -Subtidal Alternative, Projected 24" Sea-Level Rise, Pond 15 Site Plan

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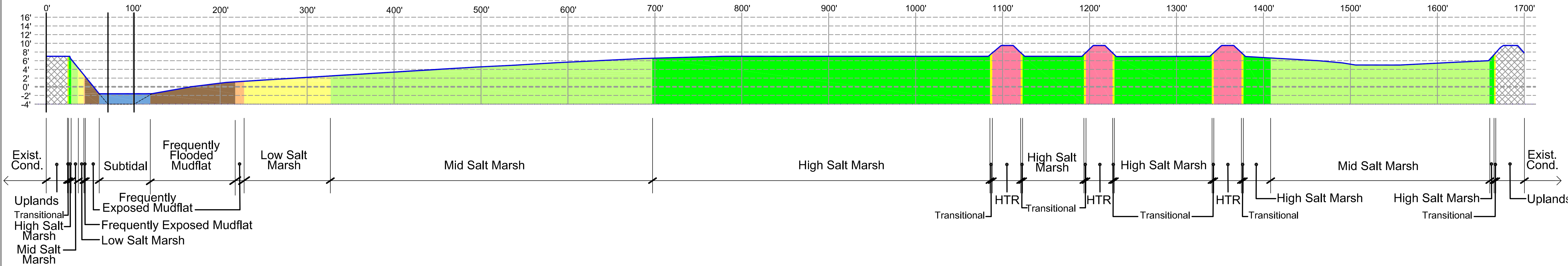
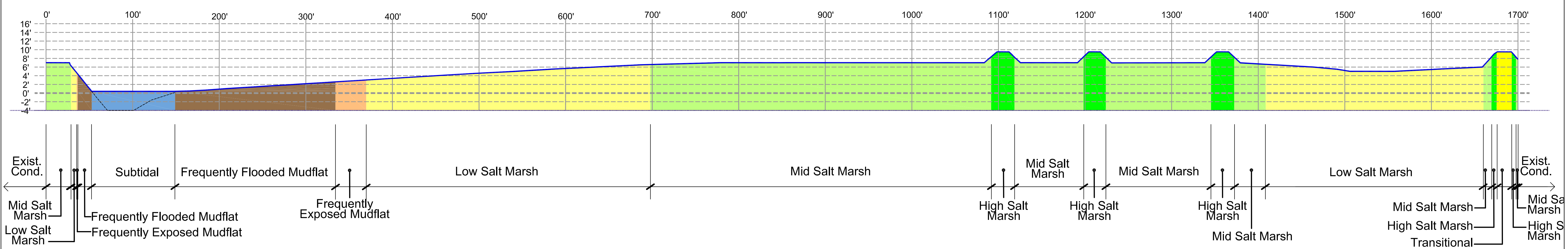
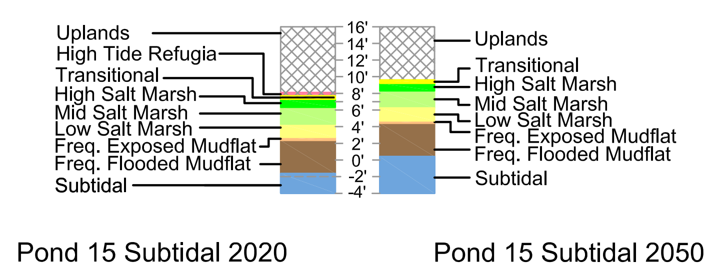


Pond 15 Cross-Section 2020



Pond 15 Cross-Section with 24" Projected Sea-Level Rise (2050)



Habitat Elevation Comparison between 2020 and 2050

NOTE:
This cross section is for illustrative purposes only, and not for construction.

VERTICAL SCALE 5x HORIZONTAL SCALE

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FIGURE 2-6f

Alternative C -Subtidal Alternative, Pond 15 Cross-Sections: 2020 and Projected 24" Sea-Level Rise (2050)

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2.3.5 Comparison of Alternatives

As outlined above, there are three potential alternatives outlined in this EIS. A comparison of implementation of each alternative is outlined in Table 2-11, a comparison of restoration acreage for each alternative is outlined in Tables 2-12 and 2-13, and associated sea-level rise is provided in Tables 2-14 and 2-15.

Table 2-11
Comparison of Earthwork Quantities

Activity	Alternative A – No Action Alternative	Alternative B - Intertidal	Alternative C - Subtidal
Material excavated from Otay River Floodplain Site	0	320,000 cubic yards	370,000 cubic yards
Material to remain on site	0	20,000 cubic yards	20,000 cubic yards
Material to be transported to Pond 15	0	260,000 cubic yards	310,000 cubic yards
Material excavated from Pond 15 Site (to remain on site)	0	50,000–60,000 cubic yards	50,000 –60,000 cubic yards
Anticipated truck trips (one-way)	0	56,000	67,000
Material to be used for Exposure Reduction Cover ~~Stockpiled material to remain on site~~	0	30,000 – 40,000 cubic yards	30,000 – 40,000 cubic yards

Source: Appendix E.

Table 2-12
Comparison of Vegetation Communities on
Otay River Floodplain Site at Project Completion

Total Habitat	Alternative B (acres)	Alternative C (acres)
Subtidal	~~0.00~~—	4.48
Mudflat, frequently flooded	4.37 ~~4.26~~	4.75 ~~4.43~~
Mudflat, frequently exposed	0.68 ~~0.79~~	1.78 ~~2.00~~
Low salt marsh	8.96 ~~8.88~~	8.28 ~~8.34~~
Mid salt marsh	11.62 ~~11.71~~	6.17 ~~6.21~~
High salt marsh	3.99 ~~3.97~~	3.95 ~~3.94~~
Transitional	0.15	0.35
*Created Wetland Habitat Total**	*29.77 ~~29.61~~*	*29.77 ~~29.41~~*
Upland habitat	3.74 ~~3.89~~	3.74 ~~4.10~~
Total*	**33.51**	**33.51**

Source: Appendix J.

Table 2-13
Comparison of Vegetation Communities on Pond 15 Site at Project Completion

Total Habitat	Alternative B (acres)	Alternative C (acres)
Subtidal	10.36 ~~10.27~~	9.81 ~~10.23~~
Mudflat, frequently flooded	16.42 ~~16.18~~	14.90 ~~16.11~~
Mudflat, frequently exposed	1.95 ~~2.36~~	1.36 ~~2.16~~
Low salt marsh	15.57 ~~15.58~~	11.92 ~~12.11~~
Mid salt marsh	34.88 ~~34.88~~	33.34 ~~28.06~~
High salt marsh	6.24 ~~5.37~~	12.56 ~~14.39~~
Transitional	0.63	0.89
*Created Wetland Habitat Total**	*86.06* ~~*84.65*~~	*84.79* ~~*83.06*~~
High Tide Refugia	0.96	2.15
Upland habitat	3.88 ~~6.26~~	3.96 ~~7.85~~
Total*	**90.90**	**90.90**

Source: Appendix J.

Table 2-14
Comparison of Vegetation Communities on the Otay River Floodplain Site in 24-Inch Sea-Level Rise Scenario

Total Habitat	Year 2050	
	Alternative B (acres)	*Alternative C (acres)*
Subtidal	3.94 ~~0.00~~	7.29 ~~4.48~~
Mudflat, frequently flooded	11.56 ~~14.01~~	12.87 ~~15.04~~
Mudflat, frequently exposed	1.96 ~~2.59~~	1.28 ~~1.48~~
Low salt marsh	8.49 ~~9.81~~	5.61 ~~6.96~~
Mid salt marsh	3.87 ~~3.51~~	2.77 ~~1.99~~
High salt marsh	*0.32* ~~*0.25*~~	*0.28* ~~*0.36*~~
Transitional	*0.15*	0.18
*Created Wetland Habitat Total**	*30.29* ~~*30.17*~~	*30.28* ~~*30.31*~~
Upland habitat	3.22 ~~3.34~~	3.22 ~~3.20~~
Total*	**33.51**	**33.51**

Source: Appendix J.

Table 2-15
Comparison of Vegetation Communities on the Pond 15 Site in 24-Inch Sea-Level Rise Scenario

Total Habitat	Year 2050	
	Alternative B (acres)	*Alternative C (acres)*
Subtidal	16.58 ~~14.20~~	16.06~~4.40~~
Mudflat, frequently flooded	28.94 ~~27.56~~	22.73~~4.95~~

Table 2-15
Comparison of Vegetation Communities on the Pond 15 Site in 24-Inch Sea-Level Rise Scenario

Total Habitat	Year 2050	
	Alternative B (acres)	*Alternative C (acres)*
Mudflat, frequently exposed	3.54 ~~4.33~~	2.94 ~~2.76~~
Low salt marsh	30.12 ~~32.45~~	29.61 ~~25.78~~
Mid salt marsh	7.82 ~~7.54~~	14.70 ~~7.31~~
High salt marsh	1.99 ~~2.25~~	2.96 ~~3.08~~
Transitional	1.91	1.91
*Created Wetland Habitat Total**	*90.90* ~~*88.32*~~	*90.90* ~~*88.28*~~
Upland habitat	— ~~2.58~~	~~2.63~~ —
Total*	**90.90**	**90.90**

Source: Appendix J.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

2.4.1 Alternative Restoration Sites and Initial Restoration Concepts

On May 9, 2009, the Regional Board approved the MLMP as a condition of the National Pollution Discharge Elimination System permit required for the project. The Regional Board conditioned this approval by requiring that mitigation occur within San Diego County unless all opportunities for restoration in the San Diego County proved to be infeasible.

Commission staff directed Poseidon to develop a wetland restoration plan for the wetland site(s) identified through the site selection process. The wetland restoration plan must meet the minimum standards and incorporate as many of the objectives set forth by the Commission as feasible, as described in Chapter 1, Introduction.

In January 2010, Poseidon submitted an analysis of 12 potential restoration sites to the Commission. The report concluded that the Otay River Floodplain site located within the San Diego Bay NWR was the best site to accomplish Poseidon's MLMP mitigation requirements and met the minimum requirements and objectives as set forth by the Commission. This site was subsequently supported by the California Department of Fish and Wildlife. On February 9, 2011, by a vote of 11-0, the Commission adopted a resolution approving the Otay River Floodplain Site. Subsequently, Poseidon developed three preliminary restoration alternatives that met Commission requirements within the Otay River Floodplain Site. Each concept included subtidal, intertidal mudflat, intertidal low, mid, and high salt marsh habitats, a wetland/upland zone, and a buffer zone on the eastern and southern portions of the site. The concepts differed in the specific acreage of each wetland zone and the manner in which these zones are laid out.

After 2011, several environmental issues resulted in modification of the conceptual restoration options. These included:

- Boundary adjustment with River Partners riparian restoration of the Otay River Floodplain
- Guidance regarding consideration of sea level rise in development of restoration plans
- The Service's desire to use sediment and soils excavated in the Otay Floodplain to restore one or more active salt ponds within the refuge to tidally influenced wetlands
- The Service's desire to avoid dredging of the Otay River
- The discovery and subsequent avoidance of significant cultural resources
- The discovery and subsequent avoidance of contaminated soils, including hazardous waste

Each of these issues resulted in a reduction in the size of restoration area within the Otay River Floodplain. An Integrated Restoration Project was developed that included a reduced restoration footprint in the Otay River Floodplain with the majority of the restoration occurring in active solar salt evaporation Pond 15 using sediment excavated from the Otay River site. Accordingly, two alternatives were developed for the Otay River Floodplain portion of the integrated project: the Subtidal Alternative and the Intertidal Alternative. Proposed restoration activities in Pond 15 are identical for both alternatives. These alternatives are presented in detail in this EIS.

2.4.2. Alternative Breach Site for Pond 15

Restoration of Pond 15 requires that the pond's outer levee be breached to facilitate the flow of tidal waters from San Diego Bay into and out of the restored pond. As proposed, the levee would be breached along the northern boundary of Pond 15, requiring excavation to create a channel with a bottom width of approximately 160 feet and bottom elevation of -3.0 feet NAVD 88. To excavate the proposed channel at this location would require that project related activities extend beyond the Refuge boundary and into an area of San Diego Bay that is under the jurisdiction of the San Diego Unified Port District (Port District). This portion of the bay was disturbed in the past to accommodate the discharge of cooling waters from the South Bay Power Plant.

To avoid extending construction activities into the Port District's jurisdiction, the potential to breach the outer levee along the westerly boundary of Pond 15 was considered, but eliminated from detailed analysis because of the extent of loss that would occur to intertidal mudflat habitat under this alternative. Extensive intertidal mudflat habitat occurs along the entire length of the pond's western boundary, supporting a range of wetland dependent organisms including migratory shorebirds, while only a thin band of intertidal mudflat borders the pond's northern outer levee. Minimizing impacts to sensitive intertidal mudflats is not feasible under an alternative that includes breaching the western outer levee of Pond 15.

2.4.3 Slurry Transport to Pond 15

The Draft EIS analyzed an additional transport method for moving material from the Otay River Floodplain Site to the Pond 15 Site. This method proposed moving the material through a pipeline as a slurry. Two possible pipeline routes were considered; both would have crossed the Otay River then extended on to the salt works following north along various levees until the pipeline reached the Pond 15 Site. Under this proposal, excavated material from the Otay River Floodplain Site would be dumped into a pit, mixed with water taken from the Otay River to form a slurried mixture of water and sediment, and then pumped to Pond 15 through the pipeline. If the pipeline method were selected, the excavated material would arrive at the Pond 15 Site in a semi-liquid state. The slurried material would be distributed throughout Pond 15 by periodically relocating the dredge pipeline to discharge material into different areas of the pond. The drawback of using this type of material transport method is the time required for sediment consolidation. To achieve a consolidation level that would allow the site to be contoured consistent with the approved restoration plans could take anywhere from one to five 5 years.

Additional analysis of the overall benefits and constraints of this method of transport indicated that the delay in achieving the elevations appropriate for supporting the range of wetland habitats proposed for Pond 15 would also delay the realization of the benefits of restoration for fish and wildlife. As a result, this method of sediment transport was eliminated from further consideration.

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CHAPTER 3
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes existing site characteristics and resources that may be affected by the Otay River Estuary Restoration Project (ORERP or proposed action). The approximately 165.3-acre project site is located within the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (NWR). The project site encompasses two separate, non-contiguous areas: the Otay River Floodplain Site and the Pond 15 Site. The 33.51-acre Otay River Floodplain Site consists of undeveloped land held in trust for the people of California by the State Lands Commission and leased to the U.S. Fish and Wildlife Service (Service) for management as a National Wildlife Refuge. The 90.90-acre Pond 15 Site is also leased to the Service from the State Lands Commission and is currently part of a component of the South Bay Salt Works, which operates on the San Diego Bay NWR under a Special Use Permit from the Service.

This chapter analyzes project-specific environmental effects, and is intended to tier from the programmatic Environmental Impact Statement and Record of Decision for the San Diego Bay NWR Comprehensive Conservation Plan. The Environmental Impact Statement for the San Diego Bay NWR is incorporated by reference (USFWS 2006).

3.1.1 Regional and Historical Setting

San Diego Bay and the San Diego Bay National Wildlife Refuge

San Diego Bay is a natural embayment located entirely in San Diego County, California, that originated from the alluvial plains of the Otay, Sweetwater, and San Diego Rivers. The entrance to the nearly enclosed water body is located approximately 9 miles northwest of the project site. San Diego Bay has a water surface area of approximately 17 square miles at mean lower low water and is approximately 15 miles in length.

San Diego Bay is located on the Southern California Bight, which is a 300-kilometer portion of the Southern California coastline that extends from Point Conception to just past the Mexico/United States border. The marine ecosystem and overall biodiversity surrounding the Southern California Bight are affected by this dramatic curve in the coastline, which creates a significant backwater eddy. This backwater eddy is created by the combined northern flow of equatorial waters along the shore and the southern flow of subarctic waters offshore. A biological transition zone occurs between these warm and cold waters, which supports approximately 500 marine fish species and more than 5,000 invertebrate species (Southern California Coastal Water Research Project 1998).

Freshwater input to San Diego Bay is primarily introduced by the Otay and Sweetwater Rivers, but there are other small tributaries that empty into San Diego Bay. Most of the dry-season inflows into San Diego Bay consist of runoff from urban sources of imported freshwater. Prior to human disturbance, the southern portion of the San Diego Bay consisted of salt marshes, intertidal mudflats, and shallow subtidal habitats. Very little natural habitat remains on the upland areas adjacent to San Diego Bay, and only scattered remnants of the coastal estuaries that once occupied the lower reaches of the Sweetwater and Otay Rivers have been preserved. A substantial portion of San Diego Bay's intertidal wetlands had been filled or dredged by the 1970s to accommodate various port developments and commercial and military ship operations. The majority of remaining natural habitat is protected within the boundaries of the San Diego Bay NWR (USFWS 2006).

The San Diego Bay NWR consists of the Sweetwater Marsh Unit and the South San Diego Bay Unit. The project site is located within the South San Diego Bay Unit, which is southeast of the Sweetwater Marsh Unit. Approximately 2,300 acres of the land and water is managed within the South San Diego Bay Unit. Of that expansive area, approximately 850 acres is open water within San Diego Bay, and the remaining 1,450 acres consists of solar salt ponds and intertidal, riparian, and upland habitats (USFWS 2006).

The South San Diego Bay Unit, located within the southern portion of San Diego Bay, has been managed by the Service since 1998. The wetlands conserved within this portion of the San Diego Bay NWR provide important foraging habitat for migratory shorebirds and other waterbirds. The qualities of the salt works located within the South San Diego Bay Unit, including limited human disturbance, isolation from human development, the availability of exposed or lightly vegetated open ground, and unrestricted visual access, make it an important nesting area for 16 bird species, including 6 species of terns. Of these species, California least tern (*Sternula antillarum browni*) is a Federally and State-listed endangered species, western snowy plover (*Charadrius nivosus nivosus*) is a Federally listed threatened species, and Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) is a State-listed endangered species. The South San Diego Bay Unit of the San Diego Bay NWR protects a diversity of endangered, threatened, migratory, and native species.

The entire southern end of San Diego Bay, including the South San Diego Bay Unit, has been recognized as a Western Hemisphere Shorebird Reserve Network Site by the Western Hemisphere Shorebird Reserve Network. Specifically, the South San Diego Bay Unit provides nesting, foraging, and resting habitat for a diverse assembly of birds, including those that migrate along the Pacific Flyway. The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to the presence of globally significant numbers of nesting western gull-billed terns (*Gelochelidon nilotica vanrossemi*), and significant numbers of surf scoters (*Melanitta perspicillata*), Caspian terns (*Hydroprogne caspia*), and western snowy plovers. Continued preservation of protected nesting areas contributes to the potential for reproductive success of the threatened western snowy plover, endangered California least tern, and an array of ground-nesting seabirds and shorebirds (USFWS 2006).

Along with the habitat availability for birds of conservation concern, San Diego Bay NWR wetlands provide high-quality habitat for a variety of fish; marine and terrestrial invertebrates; and a small number or amphibians, reptiles, and mammal species. The South San Diego Bay Unit includes areas of vegetated and non-vegetated shallow subtidal habitat, including eelgrass (*Zostera*) beds. These eelgrass beds provide highly productive microhabitats for a wide variety of invertebrates and small fish. San Diego Bay’s small population of Federally threatened East Pacific green turtle (*Chelonia mydas*) relies on eelgrass as an important food source.

The natural environment within the southern section of San Diego Bay was altered more than 100 years ago to accommodate commercial solar salt evaporation ponds. The operation, which continues to operate today, consists of a series of diked open water ponds that facilitate the concentration and precipitation of salts. South Bay Salt Works once encompassed approximately 1,300 acres. A recent (2011) restoration of intertidal habitats occurred, including to subtidal channels, intertidal mudflat, and vegetated intertidal salt marsh, in the former salt ponds that were located west of the Otay River flood control channel. Currently, the commercial salt ponds occupy approximately 830 acres within the South San Diego Bay Unit, including 23 separate ponds, as shown in Figure 1-2 of Chapter 1, Introduction, of this document. This includes approximately 300 acres of primary ponds (Ponds 12 through 15), approximately 360 acres of secondary ponds (Ponds 20 through 27), and 170 acres of ponds used in the pickling and crystallizing process (Ponds 28 through 30 and 41 through 48). Although a historical part of the San Diego economy, salt produced from these ponds does not present a significant portion of the local or large-scale salt production market (City of San Diego 2008).

In addition to managing habitats and the wildlife it supports, the San Diego Bay NWR also provides the public with wildlife viewing opportunities of the natural resources protected within the San Diego Bay NWR. To achieve the purposes for which the San Diego Bay NWR was established, which include protecting, managing, and restoring habitats for Federally listed endangered and threatened species and migratory birds, and maintaining and enhancing the biological diversity of native plants and animals, portions of the San Diego Bay NWR, such as the salt ponds, are generally closed to public access. Occasionally, guided tours are provided along the outer salt pond levees to accommodate wildlife observation during the non-breeding season. Fishing and boating are permitted within the open waters of San Diego Bay, but not within or immediately adjacent to the salt ponds or the restored salt marsh habitat at the southwestern end of San Diego Bay. Passive recreational use, including wildlife observation, environmental education, photography, and interpretation, are all available within the San Diego Bay NWR. The Bayshore Bikeway, which extends along the north side of the Otay River

Floodplain Site, provides visual access for active recreational users. A narrow corridor of salt marsh and native riparian habitat is supported within the Otay River channel and portions of Nestor Creek on and adjacent to the Otay River Floodplain Site.

Prior to inclusion within the San Diego Bay NWR, the eastern portion of the Otay River Floodplain Site was subject to habitat disturbance from farming and construction and operation of a sewage treatment facility, and the western portion of the site was at one time part of the salt works complex. Most of the native upland and wetland habitat within the Otay River Floodplain Site was removed or significantly altered due to industrial, agricultural, or municipal activities dating back to 1916.

Salt Production

The history of solar salt production in the south San Diego Bay (South Bay) began in 1871 with development of La Punta Salt Works. This small-scale salt production facility was initially constructed on approximately 60 acres in the extreme southeast corner of San Diego Bay. This facility subsequently closed, and in 1902, Graham Babcock established the Western Salt Company approximately 0.25 miles northeast of the extant La Punta Salt Works. In 1911, when E.S. Babcock took over the Western Salt Company operation, he began purchasing much of the land along the south end of San Diego Bay to expand the facility. As the facility expanded, the historic salt marsh and intertidal mudflats were eliminated by the formation of diked evaporation ponds. By 1916, the facility extended across the entire end of the South Bay. A major flood severely damaged the facility in early 1916, but reconstruction began immediately and continued through 1918 (Appendix K).

In 1922, the salt works facility was purchased by H.G. Fenton and remained under the ownership of H.G. Fenton Company until the majority of the salt works was incorporated into the South San Diego Bay Unit in 1999. The southeasternmost bittern ponds, which were not included in the San Diego Bay NWR acquisition boundary, were retained by H.G. Fenton Company until the land was sold to the Charles Company. The salt ponds included in the San Diego Bay NWR, now operated by South Bay Salt Works, continue to produce salt through solar evaporation under a Special Use Permit issued by the Service. In 2011, the salt production operation was downsized when the western salt ponds were taken out of operation and restored to tidally influenced coastal wetlands (Appendix K).

Until 1986, the portion of the Otay River floodplain previously known as the MKEG/Fenton area was primarily used for the production of truck crops. The 146-acre parcel, located to the south of the salt works facility, included the 126-acre MKEG property owned by the Egger and Ghio Corporation and a 20-acre Fenton parcel purchased by the City of San Diego in the late 1990s (USFWS 2006). The area currently consists of a combination of fallow agricultural land, which is regularly disked to control weed growth, and restored riparian habitat located to the east and west of the Otay River channel. To the west of Nestor Creek, the project site includes approximately 33.51 acres of Otay River floodplain. This area encompasses the northern one-third of what was previously referred to as Pond 20. Pond 20 was at one time part of the evaporative salt pond system operated by the Western Salt Company.

Additional information regarding existing and historical uses of the Otay River Floodplain Site is provided in Section 3.2, Physical Environment.

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3.2 PHYSICAL ENVIRONMENT

3.2.1 Topography/Visual Quality

The Otay River Estuary Restoration Project (ORERP or proposed action) is separated into two non-contiguous sites: the Otay River Floodplain Site and the Pond 15 Site. Both have a scenic aesthetic quality due to the open nature of the sites and their proximity to the coastline. The lack of significant topographic relief on Otay River Floodplain Site and Pond 15 Site and surrounding properties allows for broad views across the sites from the neighboring communities of National City, Chula Vista, Imperial Beach, and the Silver Strand (State Route 75 (SR-75)). The project sites are surrounded by scenic resources, including San Diego Bay and marshlands.

The portion of SR-75 that traverses the western perimeter of the San Diego Bay has expansive views of the Pacific Ocean to the west and San Diego Bay to the east. SR-75 is designated as an eligible scenic highway from the intersection with Interstate 5 (I-5) at Palm Avenue to its second intersection with I-5 at the east end of the Coronado Bay Bridge. Views of the project sites from this designated segment are distant from across the Bay.

According to the *San Diego Bay National Wildlife Refuge Final Comprehensive Conservation Plan and Environmental Impact Statement* (USFWS 2006), the predominant topographic features of the proposed action areas include the system of relatively low, earthen berm levees within the salt works complex and the vegetation communities and land covers of the Otay River floodplain. Due to their elevation within the depressed salt ponds and contrasts in color with salt pond waters, the levees are visible from open water areas of San Diego Bay, higher-elevation upland areas within the Otay River floodplain, and residences and public viewing areas located to the south of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (NWR). In addition to levees, sparsely vegetated soil stockpiles and occasional low-mounded, stark white salt piles are located along the eastern extent of Pond 20. A sparsely vegetated earthen berm lines the southeastern boundary of Pond 22 in the proposed action area. The waters of the salt ponds display various hues of color that vary with salinity levels, while vegetation within and adjacent to the salt ponds is generally lacking.

Otay River Floodplain Site

The 33.51-acre Otay River Floodplain Site is located within the uplands of the Otay River floodplain at the southeastern edge of San Diego Bay, as shown in Figure 1-2, Vicinity Map. The relatively flat floodplain gently slopes from southeast to northwest, ranging in elevation from approximately 9.5 to 18.5 feet above mean sea level (amsl). The flat elevation of the site and surrounding areas allows for direct views of the adjacent salt ponds and San Diego Bay to the north. These two features are the most prominent landforms in the general vicinity. The levees that form the salt ponds are visible from around the Bay and much of the developed upland areas that border the Bay to the south (USFWS 2006). The San Ysidro Mountain Range, including Otay Mountain, which is the highest point in the mountain range, is located more than 12 miles from the project site and is visible on the horizon from the site.

The gently sloping Otay River Floodplain site supports a variety of vegetation communities and land covers that ultimately characterize the approximately 33.51-acre floodplain area. Low, spreading patches of *Isocoma* scrub dominated by the yellow flowering Menzies' goldenbush (*Isocoma menziesii*) are located west of Nestor Creek and occur in relatively close proximity to unvegetated tidal channels that display the visible effects of erosion and scouring caused by floods and/or regular tidal inundation. While portions of the floodplain area support low, grey-green pickleweed (*Salicornia* sp.) plants, flowering herbs, and relatively dense stands of California cordgrass (*Spartina foliosa*) within swaths of southern salt water marsh located along Nestor Creek, the area is also marked by unvegetated and disturbed habitat resulting from repeated occurrences of mechanical perturbation. Outside of the Otay River Floodplain Site and near the Otay Valley Regional Park hike/bike trail located west of I-5 and within the floodplain, the landscape is marked by dense vegetation within the Otay River channel and by dense linear plantings of moderately tall (approximately 6 feet tall and greater) and spreading light to dark green riparian shrubs located on the River Partners Restoration parcels.

Channelized water flows along the northern boundary of the site through the Otay River and through the center of the site in a north–south direction through Nestor Creek. The western portion of the site contains levees and basins that were constructed as part of the salt pond system. The eastern portion of the site was formerly used for sewage treatment facilities and agriculture, and is currently dominated by non-native plant species (USFWS 2006).

Due to the generally flat elevation of the Otay River Floodplain Site and the surrounding area, there are limited locations where the project site is visible. Relatively unobstructed views of the site are possible from various public vantage points, including the Bayshore Bikeway and SR-75. I-5, located to the east, is slightly higher than the adjacent floodplain, providing the opportunity for distant views of the Otay River Floodplain Site, primarily from the slower lanes of I-5 between Main Street and Palm Avenue. However, even these views are somewhat obscured by native trees and shrubs recently planted in the area of the Otay River floodplain to the west of I-5.

A portion of the Bayshore Bikeway, a 24-mile-long bicycle facility that will ultimately extend around San Diego Bay, travels along a thin strip of land between the Otay River floodplain and the Otay River channel, providing views of the project site. The bikeway in this location is separated from NWR lands by a 6-foot-high chain-link fence. The Otay River channel and locations of standing water, wetlands, and variations in coastal vegetation on the Otay River Floodplain Site are visible from the bikeway. The bike and pedestrian path that extends along the eastern side of the Otay River Floodplain Site north of Saturn Boulevard also provides a public viewpoint for this site. The most unobstructed views of the Otay River Floodplain Site occur near the northern extent of 13th Street within the City of Imperial Beach.

Pond 15 Site

The Pond 15 Site is relatively flat, located directly along the southeastern edge of San Diego Bay, approximately 1.5 miles east of the Pacific Ocean. The water-filled salt pond has little to no vegetation around the water's edge or on the levees due to the high salinity. The levees and salt ponds, including the Pond 15 Site, are visible from the Bay and much of the developed upland area that borders the south Bay, including the industrially developed sites located east and northeast of the salt ponds.

The prominent visual features from the Pond 15 Site as viewed from outside the San Diego Bay NWR include the levee barrier system that separates the ponds from the tidal circulation of the surrounding Bay. Chula Vista Bayfront Park is located approximately 0.5 miles north of the Pond 15 Site. This area also has an uninterrupted distant view of the Pond 15 Site, with only the waters of the Bay and the access road to the Chula Vista Wildlife Reserve between the two areas. The Pond 15 Site is also visible from 1 to 2 miles across the Bay from the Bayshore Bikeway and the Silver Strand (SR-75).

3.2.2 Geology, Soils, and Agricultural Resources

The following five technical reports were reviewed in preparation of this section, and applicable information from each of these reports is incorporated into the discussion below.

- *Geotechnical Engineering Investigation for Western Salt Company Salt Ponds*, prepared by GEOCON Consultants Inc. (GEOCON) in 1985.
- *Limited Site Assessment for MKEG Property – Palm City Saturn Boulevard (19th Street)*, prepared by GEOCON in April 1989.
- *Geotechnical Engineering Investigation for Egger-Ghio Property*, prepared by GEOCON in October 1986.
- *Sediment Characterization Sampling and Analysis Report: South San Diego Salt Ponds 12, 13, 14, and 15*, prepared by Anchor QEA LP (Anchor QEA) ~~in April 2013~~ updated in 2017 (Appendix F1).
- *Sampling and Analysis Report: Otay River Estuary Restoration Soil Characterization Program* prepared by Anchor QEA ~~in March 2013~~ updated in 2017 (Appendix F2).

Seismicity

No known faults exist in the immediate vicinity of the project site. The closest mapped fault is the Rose Canyon Fault that traverses downtown San Diego, extends across Coronado, and then continues south into the Pacific Ocean, approximately 4 miles to the west. The Rose Canyon Fault is estimated to be able to produce a maximum seismic event of 6.0 to 6.5 on the Richter scale (GEOCON 1986). La Nacion Fault Zone, a quaternary fault, runs parallel to the Rose Canyon Fault Zone, approximately 6 miles to the east of the project sites (City of San Diego 2008a). This fault zone has an estimated potential of producing a maximum seismic event of 5.0 to 6.0 on the Richter scale. However, the probability of such an event occurring is remote. The Coronado Bank Fault Zone and the San Diego Trough Fault Zone also run approximately 10 to 25 miles west of the project sites. These fault zones are considered to be “potentially active,” having produced a magnitude 4.6 (Richter) earthquake on June 29, 1983, approximately 10 miles west of San Diego (GEOCON 1986).

South San Diego Bay is generally underlain by alluvial bay deposits that consist of loose to moderately dense, silty sands and soft to firm sandy clays. The area is generally level and not prone to landslide. Due to the soils and groundwater, the area is at risk for liquefaction and settlement that may occur as a result of ground shaking from a nearby earthquake. Liquefaction refers to an instance where soil that typically behaves as a solid is transformed into soil that behaves as a liquid, similar to quicksand. This occurs when soil below the water table is subjected to vibrations, such as those produced by earthquakes, and causes the water pressure in the pores of the soil to increase, decreasing soil strength.

The low elevation adjacent to the ocean also puts the area at risk for inundation during a tsunami associated with ground shaking. The potential ground motions that could be experienced from an earthquake event are typically expressed as a fraction of acceleration due to gravity (g). The estimated peak ground accelerations that could occur at the project site, which have a 10% probability of being exceeded in a 50-year time span, range from approximately 0.25 g to 0.32 g (California Geological Survey 2003).

Soils

Otay River Floodplain Site

The Otay River Floodplain Site is located at the western terminus of the Otay River within the Otay River floodplain. In general, the floodplain is characterized by soft alluvial bay deposits under 3 to 5 feet of uncompacted fill soils.

As shown on Figure 3.2-1, Project Site Soils, the Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam, with slopes ranging from 0% to 2%. This type of soil is often found in alluvial fans and has a high capacity to transmit water. The soil is considered fertile, with a very high water capacity and a low possibility of erosion. The eastern edge of the site is composed of Visalia gravelly sandy loam, ranging from 2% to 5% slopes. Visalia gravelly sandy loam is also commonly found in alluvial fans and has a high capacity for transmitting water. However, this soil only contains moderate available water storage capacity compared to the soil on the majority of the site. Additionally, the open space area to the east of the Otay River Floodplain Site contains areas of riverwash and Tujunga sand, both of which are common in floodplains. These soils have high water transmitting capabilities and only moderate available water storage capacity (USDA 2016).

As outlined in the *Sampling and Analysis Report: Otay River Estuary Restoration Soil Characterization Program*, prepared by Anchor QEA (Appendix F2), the Otay River Floodplain was sampled for grain size, total organic carbon (TOC), metals, pesticides, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), and semi-volatile organic carbons (SVOCs). Within the boundary of the Otay River Floodplain Site, contaminants were detected within soil samples. Detailed results of this analysis are outlined in Section 3.2.5, Hydrology and Water Quality, and Section 3.2.10, Contaminants.

Pond 15 Site

The Pond 15 Site is composed of 140 million gallons of water and underlain by Quaternary alluvium. This is silt, sand, clay, and gravel with minor cobbles and boulders generally found in river and stream bottom, valley fill, floodplain, fan, beach sand, swamp, and sand dune deposits. The Pond 15 Site is within a liquefaction hazard area—an area with shallow groundwater tables and poorly consolidated granular sediments potentially subject to hazards associated with seismically induced liquefaction, per the *City of Chula Vista General Plan Update Environmental Impact Report* geologic maps (City of Chula Vista 2005, Figures 5.5-1 and 5.5-2).

In 1985, a series of exploratory borings were excavated within the salt ponds on the levees and adjacent upland areas (GEOCON 1985). Although this study did not provide any information about soil characteristics on the bottoms of the salt ponds, it did provide general information about soil characteristics below the ponds. The investigation revealed that the levees are overlain by 2 to 7 feet of fill soils composed of loose to moderately dense silty sand and sandy gravel. Underlying these fill soils are bay deposits, older alluvial bay deposits, and bay point formation. The majority of the salt ponds are underlain by bay deposits, which consist primarily of soft bay muds. The thickness of the bay deposits varies from approximately 23 feet near the center of the salt ponds to less than 5 feet at the eastern edges of the crystallizer ponds. Older bay deposits alluvium occurs below the bay deposits and immediately beneath the fill soils along the southeastern edge of the San Diego Bay NWR, and is composed of saturated, firm, silty sandy shallow bay deposits and/or older bay deposits alluvium. The soil characteristics of the bay point formation include stiff to hard sandy clays and dense to very dense silty sand (GEOCON 1985).

Geologic Hazards

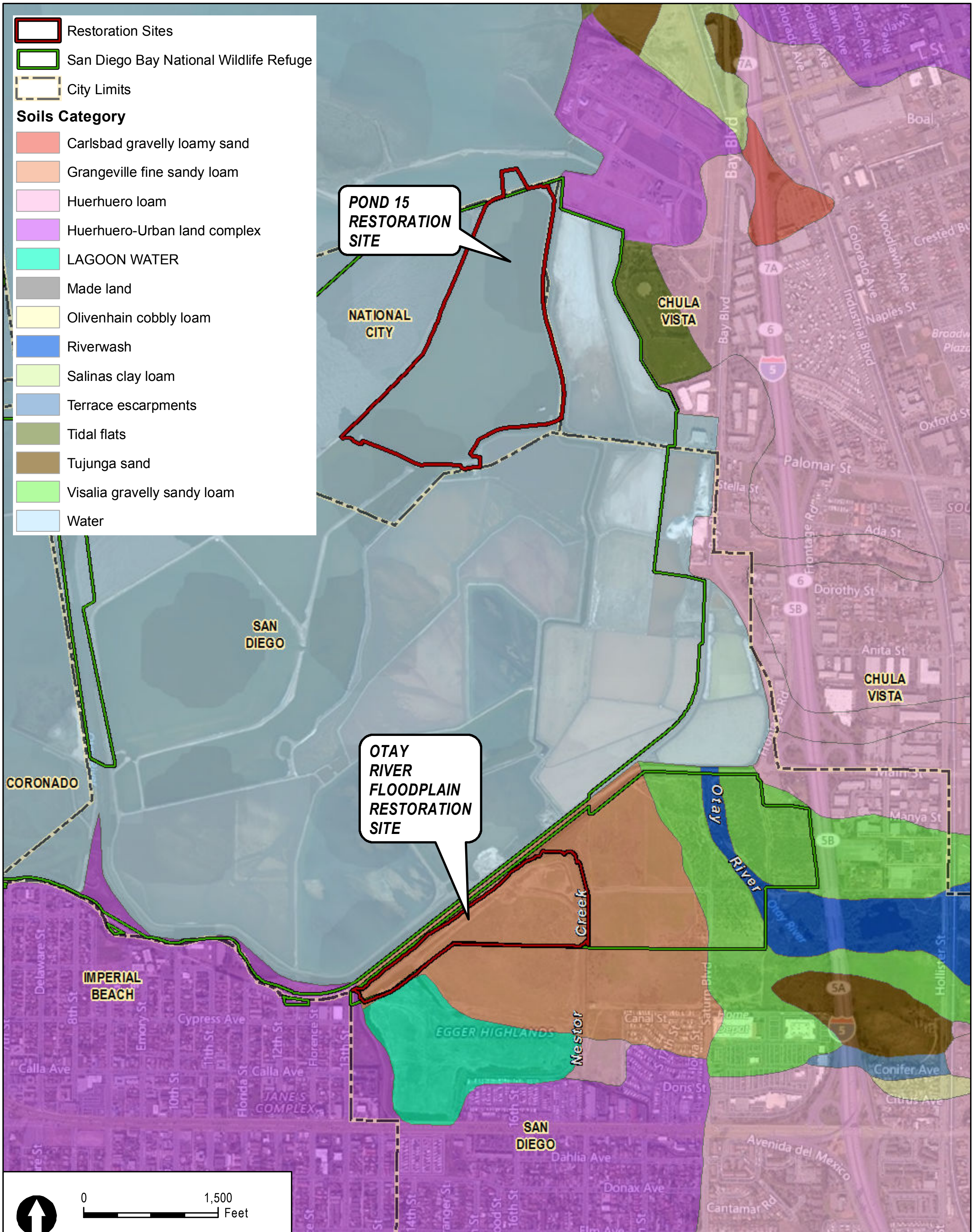
Otay River Floodplain Site

The Otay River Floodplain Site is located within Geologic Hazard Category 33 (Low Liquefaction Potential – fluctuating groundwater, minor drainages) on the City of San Diego (City) Seismic Safety Study, Geologic Hazards and Faults Grid Tile 6 (City of San Diego 2008a). The groundwater level exists within a range of 3 to 8 feet below the surface due to the local groundwater gradient (USFWS 2006). According to a geotechnical investigation performed by GEOCON in 1986 on the Otay River floodplain, the loose to moderately dense, silty sand deposits found on the Otay River Floodplain Site are considered susceptible to potential liquefaction in the event of a moderate to heavy ground motion. It was determined that these soils have a moderate to high potential for liquefaction considering the shaking characteristics of a 6.0 magnitude earthquake. However, the clayey silts, silty clays, and sandy gravels of the alluvial bay deposits were determined to possess a low liquefaction potential (GEOCON 1986).

The Otay River Floodplain Site is not located within the tsunami inundation area on the California Emergency Management Agency Tsunami Inundation Map for Emergency Planning, Imperial Beach Quadrangle (CalEMA 2009).

Pond 15 Site

The Pond 15 Site is composed of approximately 140 million gallons of water; therefore, liquefaction hazard in this area is high. In addition, the Pond 15 Site is located within the tsunami inundation area on the California Emergency Management Agency Tsunami Inundation Map for Emergency Planning, Imperial Beach Quadrangle (CalEMA 2009). Additionally, project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a would be located within the tsunami inundation area (CalEMA 2009).



SOURCE: BING MAPPING SERVICE

FIGURE 3.2-1

Project Site Soils

Otay River Estuary Restoration Project EIS

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Agricultural Resources

Otay River Floodplain Site

Both the County of San Diego (County) and the City of San Diego have experienced a loss in available agricultural land from the expansion of urban development. The areas designated as important agricultural resources by the Department of Conservation Farmland Mapping and Monitoring Program are identified on Figure 3.2-2, Farmland Mapping and Monitoring Program Designations. The best soils for agricultural production in San Diego County are primarily located in the western inland areas and in northern parts of the County. In the City of San Diego, agriculture is primarily located in the San Pasqual Valley, where it represents more than 30% of the land use (City of San Diego 2008b).

Portions of the Otay River Floodplain were identified as Prime Farmland in 1998, according to the California Department of Conservation. Prime Farmland is defined as land with the best combination of physical and chemical characteristics for sustaining long-term production of agricultural crops (USFWS 2006). However, in 2008 these portions of the Otay River Floodplain were designated as Farmland of Local Importance. Farmland of Local Importance is defined as land that meets all of the characteristics of prime and State-wide importance, with the exception of irrigation, or farmlands that are of significant economic importance to the County, such as having a history of good production for locally adapted crops. The soils of these lands are suited for truck crops and orchard crops and have a history of good production for locally adapted crops of significant economic importance to the County (CDOC 2013a).

The Otay River Floodplain Site is primarily composed of Visalia sandy loam and Grangeville fine sandy loam soils. These soils are recognized as fertile soils for agricultural production. The project site is also located within the Maritime Climate Zone, where temperatures and humidity depend primarily on the conditions of the Pacific Ocean. The climate is favorable to agriculture because of the small range of season and diurnal temperature changes and high humidity (USFWS 2006). The Otay River floodplain was used for agricultural purposes from the mid-1930s until 1988 for production of various crops, including bell peppers, beans, cucumbers, tomatoes, cabbage, and celery, with tomatoes as the principal crop. The land was taken out of agricultural production due to the market uncertainty as well as increasing costs for water and labor compared to the surrounding areas (USFWS 2006). As of 2012, the Department of Conservation identifies the Otay River Floodplain Site as mostly “Other Land,” with 35.6 acres of Farmland of Local Importance (CDOC 2013a) in and around the site.

Pond 15 Site

Due to the high volume of water in this area, the Pond 15 Site is designated as "Other Land," not specified for agricultural use within the San Diego County Important Farmland Map (CDOC 2013b).

3.2.3 Mineral Resources

Otay River Floodplain Site

Mineral Resource Zones for the City of San Diego, which indicate the probability of an area having valuable mineral resources, are shown on Figure 3.2-3, Mineral Resource Zones. The Otay River Floodplain Site is classified by the City as a Mineral Resource Zone 1, which is considered an area where no significant mineral deposits are present or where it is judged that there is little likelihood for their presence (City of San Diego 2008b). No mineral resources of value are expected to occur on the Otay River Floodplain Site.

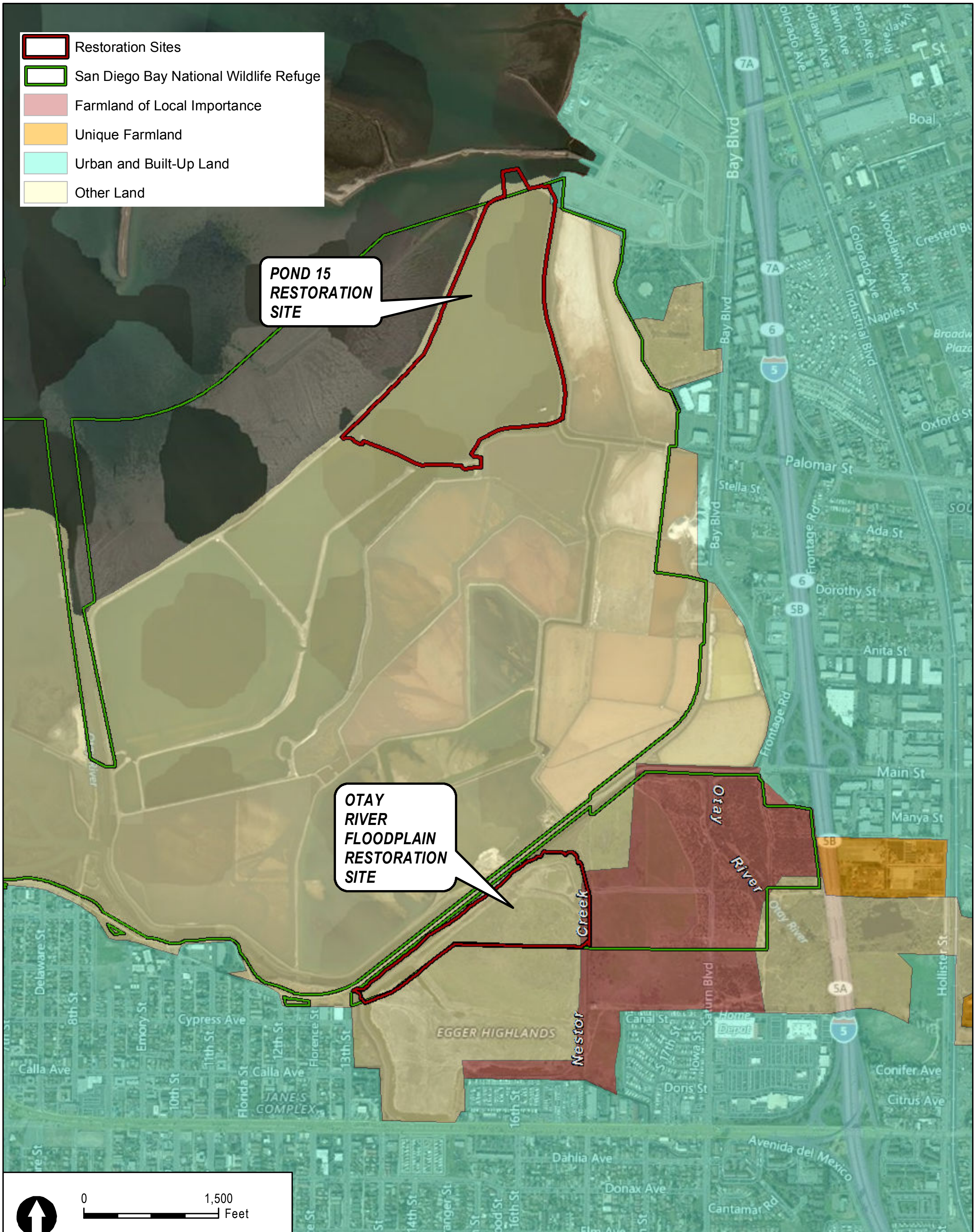
Pond 15 Site

Although the Pond 15 Site is a part of the salt production at the South Bay Salt Works, the area is classified as Mineral Resource Zone 1 (refer to Figure 3.2-3), with a portion of the site not classified at all. As mentioned for the Otay River Floodplain Site, Mineral Resource Zone 1 is an area where no significant mineral deposits are present or where it is judged that there is little likelihood for their presence. No mineral resources of value are expected to occur on the Pond 15 Site.

3.2.4 Paleontological Resources

Paleontological resources (fossils), defined as the remains, imprints, and/or traces of prehistoric plant and animal life exclusive of human remains or artifacts, represent a limited, non-renewable, sensitive scientific and educational resource. Fossil remains such as animal bones and teeth, shells, and wood are found in the geologic deposits (rock formations) in which they were originally buried and provide scientists with the opportunity to explore the history of life on earth.

The potential for fossil remains at a location can be predicted through previous correlations that have been established between the fossil occurrence and the geologic formations within which they are buried. For this reason, knowledge of the geology of a particular area and the paleontological resource sensitivity of particular rock formations makes it possible to predict where there is a high or low potential for fossils to be present in a given area. However, there are some formations in which the potential for fossils to be present is harder to predict.



SOURCE: BING MAPPING SERVICE

FIGURE 3.2-2

Farmland Mapping and Monitoring Program Designations

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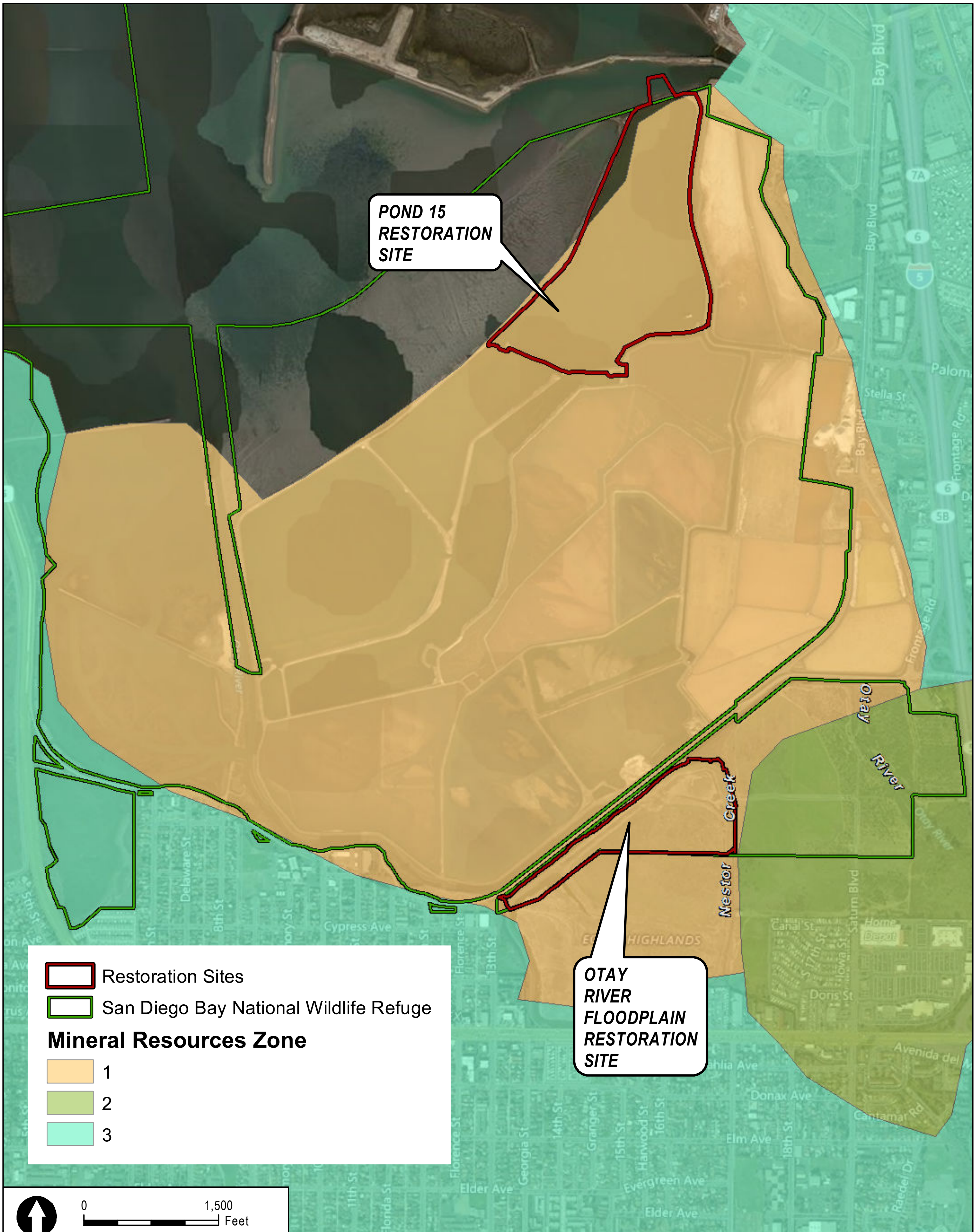

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 3.2-3

Mineral Resource Zones

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Otay River Floodplain Site

The Otay River Floodplain Site is located at the western terminus of the Otay River within the Otay River floodplain. In general, the floodplain is characterized by soft alluvial/bay deposits under 3 to 5 feet of uncompacted fill soils. As shown on Figure 3.2-1, the Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam at slopes ranging from 0% to 2%. The eastern edge of the site is composed of Visalia gravelly sandy loam ranging from 2% to 5% slopes. Additionally, the open space area to the east of the Otay River Floodplain Site contains areas of riverwash and Tujunga sand, both of which are common in floodplains (USDA 2011). Surface mapped younger alluvium in this area overlies the bay point formation. The bay point formation has a high sensitivity rating for paleontological resources (City of San Diego 2007) and is known to produce Pleistocene age, scientifically significant paleontological resources throughout the South Bay.

Pond 15 Site

As noted above, the Pond 15 Site is composed of 140 million gallons of water and is underlain by Quaternary alluvium. According to the borings conducted on the Pond 15 Site during the 1985 exploration, the levees are overlain by 2 to 7 feet of fill soils and underlain by bay deposits including older alluvial bay deposits and bay point formation. The majority of the salt ponds are underlain by bay deposits, which consist primarily of soft bay muds. The thickness of the bay deposits varies from about 23 feet near the center of the salt ponds to less than 5 feet at the eastern edges of the crystallizer ponds. Older bay deposits/alluvium occurs below the bay deposits and is composed of saturated, firm, silty sandy, shallow bay deposits, and/or older bay deposits/alluvium, immediately beneath the fill soils along the southeastern edge of the San Diego Bay NWR (GEOCON 1985). As described previously, the bay point formation has a high sensitivity rating for paleontological resources (City of San Diego 2007) and is known to produce Pleistocene age, scientifically significant paleontological resources throughout the South Bay.

3.2.5 Hydrology and Water Quality

The following two technical reports were reviewed in preparation of this section, and applicable information from each of these reports is incorporated into the discussion that follows.

- *Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan* prepared by Dr. Scott A. Jenkins Consulting in September 2014 (Appendix G).
- *Otay River Estuary Restoration Project Fluvial Hydraulics Study*, prepared by Everest International Consultants Inc. in October 2014 and revised in 2017 (Appendix H).

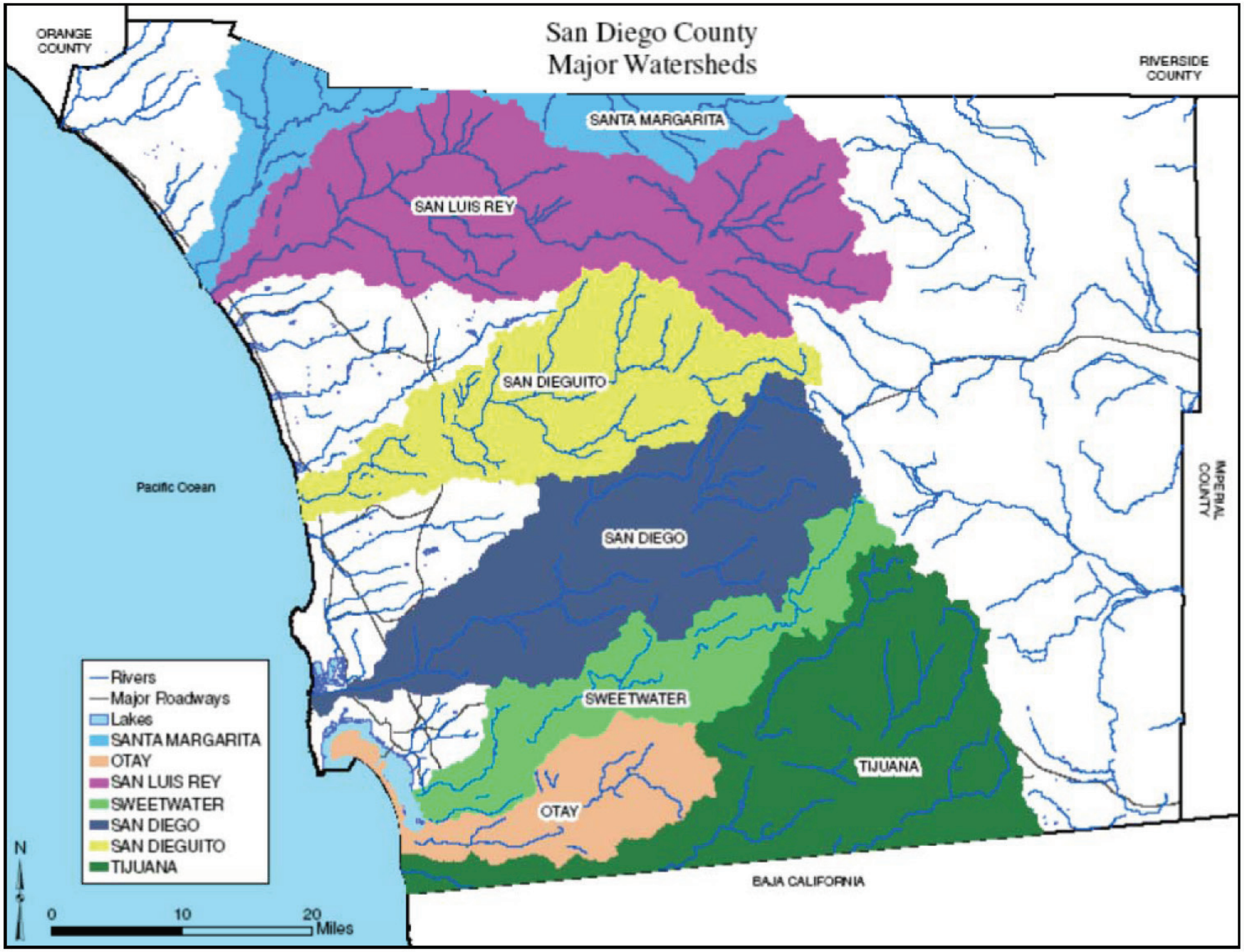
Hydrology

The Otay River Watershed is located in San Diego County, California. The 145-square-mile watershed is situated between the Sweetwater and Tijuana River watersheds, as shown on Figure 3.2-4, Otay River Watershed. The Otay River originates in the Cleveland National Forest along Dulzura Creek, with several tributaries, including Hollenbeck Canyon Creek, Jamul Creek, and Proctor Valley Creek. Watershed flows are cut off by two reservoirs that are a part of the City's Water Supply System: the Upper Otay Reservoir and the Lower Otay Reservoir. The Otay River floodway runs westward approximately 11 miles through primarily undeveloped lands from Savage Dam to San Diego Bay. Tributaries in this section of the river include O'Neal Canyon Creek, Poggi Canyon Creek, Salt Creek, Johnson Canyon, Wolf Canyon, and Dennery Canyon (Appendix H).

The Otay River conveys flows from the I-5 Bridge through the Otay River Floodplain and estuarine portion of the Otay River. On the west side of I-5, the river channel, which was modified more than 100 years ago, turns northwest toward South Bay Salt Works, then westward along the perimeter of Ponds 48, 20, and 22, specifically as shown on Figure 1-2,Vicinity Map. After its confluence with Nestor Creek, the Otay River continues along the northern edge of the Otay River Floodplain Site and along the western side of Ponds 23 and 12, finally discharging into the San Diego Bay (Appendix H).

Hydraulic conditions along the Otay River are affected by a combination of tidal exchange with San Diego Bay and watershed flows from the Otay River. Tidal influence extends from San Diego Bay toward the floodplain near Pond 48 at the northeastern corner of the Otay River Floodplain Site. Tidal processes have a major impact in the general vicinity of the project site, including tidal inundation as an essential part of the survival of coastal wetland habitats. Mixed semidiurnal tides[1] occur each day that circulate the Bay waters and produce currents that influence salinity and temperature throughout the San Diego Bay. Tidal conditions within the Bay are measured by a long-term primary tide gauge at the Navy Pier, operated and maintained since 1900 by the National Oceanographic and Atmospheric Administration (NOAA). In addition to tidal variance, the water levels in the Bay are also influenced by El Niño–Southern Oscillation events and long-term changes in sea level.

[1] An area has a mixed semidiurnal tidal cycle if it experiences two high and two low tides of different size every lunar day.



Source: County of San Diego 2007

FIGURE 3.2-4
Otay River Watershed

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Urban development and human disturbance have had a major impact on the natural hydrologic, geomorphic, and ecologic functions in the vicinity of the proposed action. Construction of the Upper and Lower Otay Reservoirs have significantly altered the historical hydrologic conditions downstream of the dams. These reservoirs control approximately 68% of the watershed, reduce the frequency of flows in the Otay River, and capture sediments that historically were carried downstream toward San Diego Bay (Appendix H). Additional human disturbances include construction of the salt ponds, previous agricultural operations, the realignment and construction of both the Otay River channel and the Nestor Creek drainage, the construction of the railroad along the south end of the salt ponds, and development and operation of a sewer treatment facility near the northeast corner of Pond 20A in the 1950s and 1960s.

Groundwater elevations range from approximately 3 to 8 feet below mean sea level. In addition, capillary fringe of this groundwater may extend approximately 1 to 2 feet above groundwater elevation (GEOCON 1986). Due to the proximity of the Pacific Ocean, groundwater at the Otay River Floodplain Site is slightly brackish, limiting vegetation to species with salt tolerance (GEOCON 1986).

The Otay River Watershed has a semi-arid climate, with precipitation typically occurring during winter months (November through April), with infrequent (approximately 10%) precipitation during the summer. The average annual precipitation in the lower Otay River Watershed ranges from approximately 10 to 11 inches per year. Precipitation in the upper Otay River Watershed generally ranges from 13 to 20 inches per year. The highest annual precipitation occurs at the mountain peaks of San Miguel Mountain, the Jamul Mountains, Otay Mountain, and Lyons Peak (see Figure 3.2-5, Otay River Watershed Average Annual Precipitation). In San Diego County, heavy precipitation is generally caused by large weather systems generated in the Pacific Ocean. Local floods are commonly the result of localized, intense thunderstorms, normally in late summer and fall months. Floods can also be due to tropical storms generated in the Tropical Pacific (County of San Diego 2007).

Flood hazards are identified by the Federal Emergency Management Agency (FEMA) Flood Insurance Study. The most recent Flood Insurance Study for San Diego County documents return period peak flows for the Otay River as summarized in Table 3.2-1. The initial hydrologic and hydraulic analyses for the Otay River were conducted in 1981 by the California Department of Water Resources for FEMA. Hydrologic and hydraulic analyses for the Otay River between Nestor Creek and San Diego Bay were updated by the U.S. Army Corps of Engineers, Los Angeles District in December 1989. There are no major flooding problems along the Otay River, although some areas downstream of Boulevard Avenue within the City of Imperial Beach will be inundated by the 100-year flood (FEMA 2012). In addition, the Otay River below Savage Dam is within the dam inundation zone (County of San Diego 2007).

Table 3.2-1
FEMA Return Period Peak Discharges for the Otay River

Otay River	Drainage Area (square miles)	Return Peak Discharges (cubic feet per second)			
		10-Year	*50-Year*	*100-Year*	*500-Year*
At Otay Valley Road	122.7	1,200	12,000	22,000	50,000

Source: FEMA 2012.

Hydraulic conditions along the Otay River are affected by a combination of tidal exchange with San Diego Bay and watershed flows from the Otay River. In order to assess the potential for flooding during the 100-year storm event in the existing condition, a two-dimensional hydrodynamic model "TUFLOW" (Two-Dimensional Unsteady Flow) was used (Appendix H). This model accounts for tidal fluctuation, flood flow, grading changes, and water control structures. TUFLOW is a finite difference model designed for tidal and fluvial hydraulics in rivers, estuaries, coastal bays, floodplains, and urban areas. Using the TUFLOW model, flood conditions were simulated for existing conditions. In the event of a flood, flows would inundate the Otay River Floodplain, and then enter the South Bay Salt Works ponds from Ponds 51, 20, and 22. The salt ponds would be filled from primarily the west and east sides before overtopping the levees toward San Diego Bay. Although sediment delivery into the ponds from the floodwaters would be low, sediments within the ponds would likely be redistributed.

In addition to the 100-year storm event, flooding would occur along the Bayshore Bikeway during the 10- and 15-year storm events. The mobile home parks along Palm Avenue between 15th Street and Saturn Boulevard to the southwest of the project site, the parking lots within the commercial center to the east of Saturn Boulevard, Swiss Park, and other properties to the north of Main Street are all subject to flooding during storm events.

Currents in San Diego Bay are predominantly produced by tides (Wang et al. 1998). This tidal exchange between the ocean and San Diego Bay is a result of a phenomenon called "tidal pumping" (Chadwick et al. 1996). The "pumping" of water is due to the flow difference between the ebb tide and flood tide flows. Being located at mid-latitude, tides and currents within San Diego Bay are dominated by a mixed semidiurnal component (Peeling 1975). Typical tidal current speeds range between 0.3–0.5 meters per second (1–1.6 feet per second) near the inlet and 0.1–0.2 meters per second (0.3–0.7 feet per second) in the southern region of the Bay. The phase propagation suggests that the tides behave almost as standing waves, with typical lags between the inlet and southern region of the Bay of 10 minutes and an increase in tidal amplitude in the inner Bay compared to the outer Bay.

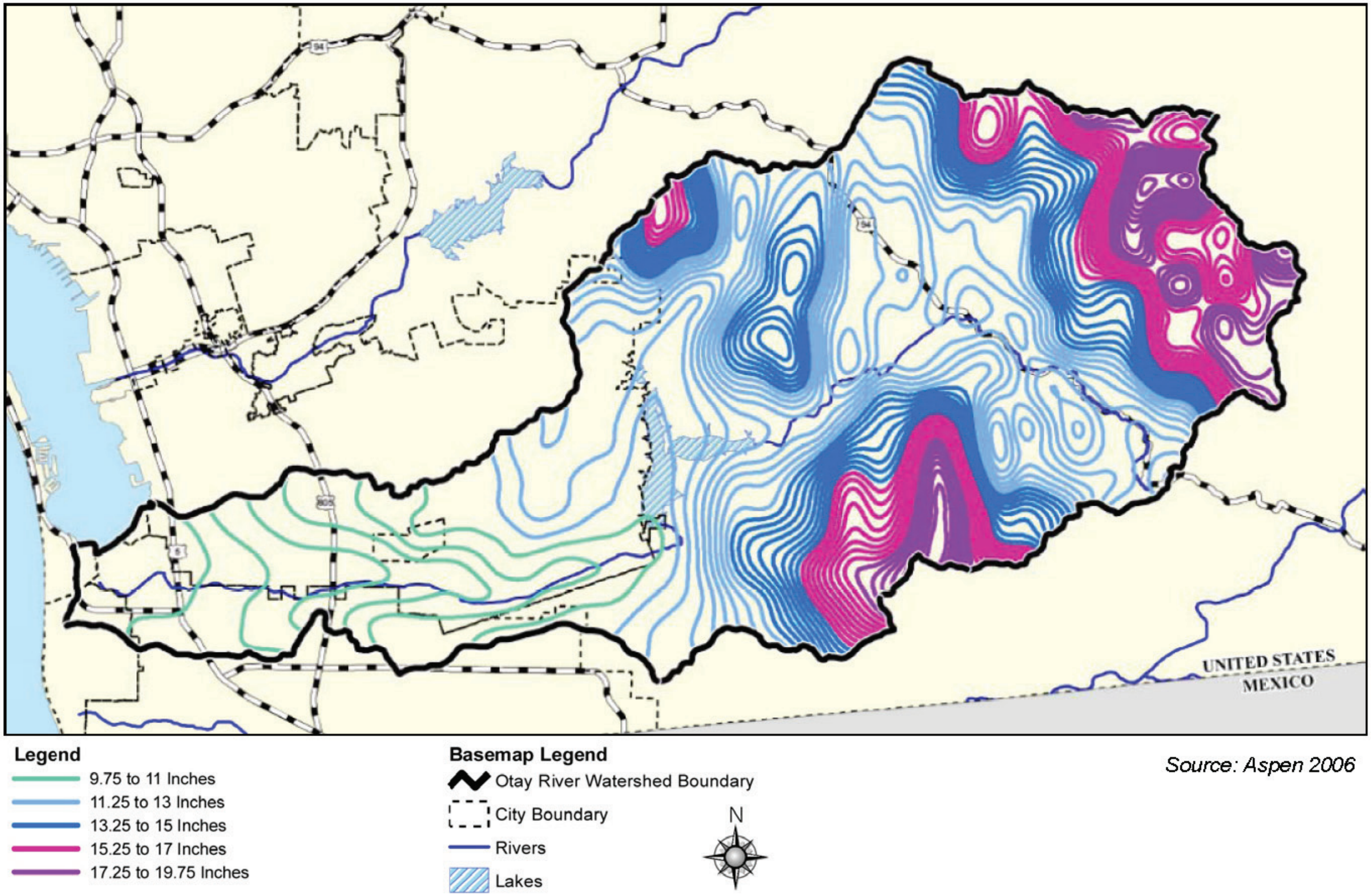

FIGURE 3.2-5

Otay River Watershed Average Annual Precipitation

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Water Quality

Water quality within the project site is regulated by the San Diego Regional Water Quality Control Board (Regional Board), through the Water Quality Control Plan for the San Diego Basin (Basin Plan). The Basin Plan designates beneficial uses for water bodies in the San Diego Region, and provides water quality objectives and implementation plans to protect those beneficial uses. The project site is located within the Otay Hydrologic Unit, specifically within the Otay Valley Hydrologic Area, designated 910.2 (Regional Board 2004). In addition, the Clean Water Act 303(d) list highlights any impaired surface water bodies within the region.

Historically, water quality in the San Diego Bay suffered serious degradation due to discharge of untreated municipal sewage and industrial wastes. Due to numerous surrounding jurisdictions and the number of separate agencies discharging to the Bay, the San Diego Bay Interagency Water Quality Panel was established in 1988 to address water quality concerns and ensure the long-term viability of the Bay. This panel completed a Comprehensive Management Plan for San Diego Bay in 1998 to protect its value and resources. Also in 1998, the Bay was included within the California Section 303(d) list as an impaired water body by the Regional Board due to benthic community degradation and toxicity. Currently, all of the San Diego Bay is listed on the 303(d) list, but only for PCBs; however, the Regional Board has proposed that the Bay be listed for arsenic, mercury (tissue) and polycyclic aromatic hydrocarbons (PAHs) (Regional Board 2016).

The Otay River Sonde is a self-recording water quality monitoring station located at the mouth of the Otay River between Ponds 11 and 12, operated by the Tijuana River National Estuarine Research Reserve and managed through the Southwest Wetland Interpretive Association. It recorded water level, salinity, and dissolved oxygen (DO) at 15-minute intervals from December 2007 to December 2011. The maximum salinity reached during the dry, evaporative summer months was recorded at 42.57 parts per thousand (ppt), while the minimum salinity during the wet winter periods reached as low as 0.2 ppt. The average salinity at the Otay River Sonde was 33.52 ppt, identical to the average salinity recorded on the open coast at the pier at Scripps Institute of Oceanography, approximately 10 miles north of the San Diego Bay. These salinity levels are suitable for a healthy, functioning tidal wetland (Appendix G). These DO readings show a maximum DO during wet winter months of 17.5 milligrams per liter (mg/L), while the minimum DO occurs during summer months, and can reach 0.0 mg/L. The average DO is 6.47 mg/L, which is similar to DO levels recorded in nearshore waters along the open coast, as measured at the pier at Scripps Institute of Oceanography. DO maximums occur during Otay River flooding events and the salinity is depressed to minimum values. Conversely, DO minimums occur during warm, evaporative months in the summer when the Bay waters turn hypersaline. This variability in salinity and DO are within the normal limits of a healthy, functioning tidal wetland (Appendix G).

3.2.6 Air Quality

San Diego Region

The weather of the San Diego region, as in most of Southern California, is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average annual temperature ranges (in degrees Fahrenheit (°F)) from the mid-40s to the high 90s. Most of the region's precipitation falls November through April, with infrequent (approximately 10%) precipitation during the summer. Although total annual precipitation in the region can vary greatly from year to year, the average seasonal precipitation along the coast is approximately 10 to 11 inches; the amount increases with elevation as moist air is lifted over the mountains to the east.

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east. Along with local meteorology, the topography influences the dispersal and movement of pollutants in the San Diego Air Basin (SDAB). The mountains to the east prevent dispersal of pollutants in that direction and help trap pollutants in inversion layers.

The interaction of ocean, land, and the Pacific High Pressure Zone maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). Local terrain is often the dominant factor inland, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

Ambient Air Quality Standards

Under the Federal Clean Air Act passed in 1970 and last amended in 1990, the task of air quality management and regulation has been legislatively granted to the California Air Resources Board (CARB), with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB is responsible for ensuring implementation of the California Clean Air Act, responding to the Federal Clean Air Act, and regulating emissions from motor vehicles and consumer products. Pursuant to the authority granted to it, CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the National Ambient Air Quality Standards (NAAQS).

The NAAQS and CAAQS are presented in Table 3.2-2.

Table 3.2-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary[c,d]*	*Secondary[c,e]*
O_3[f]	1-hour	0.09 ppm (180 µg/m³)	—	Same as Primary Standard
	8-hour	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)	
CO	1-hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	—
	8-hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
NO_2[g]	1-hour	0.18 ppm (339 µg/m³)	0.100 ppm (188 µg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	
SO_2[h]	1-hour	0.25 ppm (655 µg/m³)	0.075 ppm (196 µg/m³)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m³)
	24-hour	0.04 ppm (105 µg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24-hour	50 µg/m³	150 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m³	—	
$PM_{2.5}$[i]	24-hour	—	35 µg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m³	12.0 µg/m³	15.0 µg/m³
Lead[j,k]	30-day Average	1.5 µg/m³	—	—
	Calendar Quarter	—	1.5 µg/m³ (for certain areas)[j]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 µg/m³	
Hydrogen sulfide	1-hour	0.03 ppm (42 µg/m³)	—	—
Vinyl chloride[j]	24-hour	0.01 ppm (26 µg/m³)	—	—
Sulfates	24-hour	25 µg/m³	—	—
Visibility reducing particles[l]	8-hour	See footnote l	—	—

Source: CARB 2016a.

Notes: ppm = parts per million by volume; µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; PST = Pacific Standard Time.

a California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than 1. For PM2.5, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25° Celsius (C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

e National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[l] In 1989, CARB converted both the general State-wide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the State-wide and Lake Tahoe Air Basin standards, respectively.

An area is designated in attainment when it is in compliance with the NAAQS and/or CAAQS. These standards are set by the U.S. Environmental Protection Agency (EPA) and CARB, respectively, for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable impacts on human health or the public welfare.

The criteria pollutants of primary concern that are considered in this analysis are ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse particulate matter (particulate matter less than or equal to 10 microns in diameter; PM_{10}), and fine particulate matter (particulate matter less than or equal to 2.5 microns in diameter; $PM_{2.5}$). Although there are no ambient standards for volatile organic compounds (VOCs) or oxides of nitrogen (NO_x), they are important as precursors to O_3.

The portion of the SDAB where the project site is located is designated by the EPA as an attainment area for the 1997 8-hour NAAQS for O_3 and as a moderate nonattainment area for the 2008 8-hour NAAQS for O_3.The SDAB is designated in attainment for all other criteria pollutants under the NAAQS with the exception of PM_{10}, which was determined to be unclassifiable.

The SDAB is currently designated nonattainment for O_3, PM_{10}, and $PM_{2.5}$, under the CAAQS. It is designated attainment for the CAAQS for CO, NO_2, SO_2, lead, and sulfates.

Table 3.2-3 summarizes the SDAB’s Federal and State attainment designations for each of the criteria pollutants.

Table 3.2-3
San Diego Air Basin Attainment Classification

Pollutant	Federal Designation	State Designation
O_3 (1-hour)	Attainment[a]	Nonattainment
O_3 (8-hour – 1997) (8-hour – 2008)	Attainment (maintenance) Nonattainment (moderate)	Nonattainment
CO	Unclassifiable/attainment[b]	Attainment
PM_{10}	Unclassifiable[c]	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
NO_2	Unclassifiable/attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(No Federal standard)	Attainment
Hydrogen sulfide	(No Federal standard)	Unclassified
Visibility-reducing particles	(No Federal standard)	Unclassified

Sources: EPA 2014 (Federal); CARB 2014 (State).
Notes: O_3 = ozone; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide.

[a] The Federal 1-hour standard of 0.12 ppm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in State Implementation Plans.

[b] The western and central portions of the SDAB are designated attainment, while the eastern portion is designated unclassifiable/attainment.

[c] At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

Air Quality Monitoring Data

The San Diego Air Pollution Control District operates a network of 10 ambient air monitoring stations throughout San Diego County, which measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and NAAQS. The Chula Vista monitoring station is the nearest location to the project site where criteria pollutant concentrations are monitored, except CO. CO values were taken from the El Cajon monitoring station.

Ambient concentrations of pollutants from 2011 through 2015 are presented in Table 3.2-4. The number of days exceeding the respective ambient air quality standards is shown in Table 3.2-5. Air quality within the project region is in compliance with both CAAQS and NAAQS for NO_2, CO, and SO_2.

Table 3.2-4
Ambient Air Quality Data

Pollutant	Averaging Time	2012	2013	2014	2015	Most Stringent Ambient Air Quality Standard	Monitoring Station
O_3	8-hour	0.079 ppm	0.063 ppm	0.072 ppm	0.067 ppm	0.070 ppm	Chula Vista[a]
	1-hour	0.085 ppm	0.073 ppm	0.093 ppm	0.088 ppm	0.09 ppm	
PM_{10}	Annual	21.5μg/m^3	23.7μg/m^3	23.4 μg/m^3	19.8 μg/m^3	20 μg/m^3	Chula Vista[a]
	24-hour	38.0 μg/m^3	40.0 μg/m^3	39.0 μg/m^3	45.0 μg/m^3	50 μg/m^3	
$PM_{2.5}$	Annual[b]	10.2 μg/m^3	9.5μg/m^3	9.2 μg/m^3	8.3 μg/m^3	12 μg/m^3	Chula Vista
	24-hour	34.3 μg/m^3	21.9μg/m^3	26.5 μg/m^3	33.5 μg/m^3	35 μg/m^3	
NO_2	Annual	0.011 ppm	0.011 ppm	0.011 ppm	0.010 ppm	0.030 ppm	Chula Vista
	1-hour	0.057 ppm	0.057 ppm	0.055 ppm	0.049 ppm	0.18[c] ppm	
CO	8-hour	1.85 ppm	1.20 ppm	1.40 ppm	1.10 ppm	9.0 ppm	El Cajon[d]
	1-hour[e]	2.20 ppm	1.90 ppm	1.50 ppm	1..40 ppm	20 ppm	
SO_2	Annual	0.16	0.14	0.10	0.11	0.030 ppm	Chula Vista
	24-hour	0.5	0.6	0.50	0.40	0.04 ppm	

Sources: CARB 2015; EPA 2015.
Notes: Data represent maximum values.
O_3 = ozone; PM_{10} = coarse particulate matter; μg/m^3 = micrograms per cubic meter; $PM_{2.5}$ = fine particulate matter; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; N/A = not applicable.
a Chula Vista Monitoring Station located at 80 E. J Street, Chula Vista, California.
b Annual data for 2010 and 2011 $PM_{2.5}$ taken from El Cajon Monitoring Station.
c A new 1-hour NAAQS for NO_2 became effective in April 2010. Data reflect compliance with the 1-hour CAAQS.
d El Cajon monitoring station is located at West Bradley Avenue and Floyd Smith Drive in El Cajon, California.
e Data were taken from EPA 2016a for 1-hour CO and 2013 8-hour CO.

Table 3.2-5
Frequency of Air Quality Standard Violations

Monitoring Site	Year	Number of Days Exceeding Standard					
		State 1-Hour Ozone	*State 8-Hour Ozone*	*National 8-Hour Ozone*	*State 24-Hour PM_{10}*	*National 24-Hour PM_{10}*	*National 24-Hour $PM_{2.5}$*
Chula Vista	2011	0	0	0	0	0	—
	2012	0	1	1	0	0	0
	2013	0	0	0	0	0	0
	2014	0	1	0	0	0	0
	2015	0	0	0	0	0	0

Source: CARB 2015.
Notes: PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and 3 days, respectively. "Number of days exceeding the standards" is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored.

Regional Emissions Inventory

As previously discussed, the portion of the SDAB where the project site is located is designated by the EPA as an attainment area for the 1997 8-hour NAAQS for O_3 and as a marginal nonattainment area for the 2008 8-hour NAAQS for O_3. The SDAB is designated in attainment for all other criteria pollutants under the NAAQS with the exception of PM_{10}, which was determined to be unclassifiable.

Table 3.2-6 shows the annual average daily emission rates for the estimated stationary sources, area-wide sources, and mobile regional emissions inventory for the SDAB (CARB 2012).

Table 3.2-6
Estimated 2012 Annual Average Regional Emissions Inventory for the SDAB

Source	Pollutant (tons/day)					
	VOCs	*CO*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Stationary sources	30.0	13.9	4.7	0.3	6.0	2.5
Area-wide sources	35.5	15.2	2.6	0.1	56.7	10.9
Mobile sources	60.5	496.4	98.4	0.9	9.7	6.6
Total	**126.0**	**525.5**	**105.7**	**1.3**	**72.4**	**20.0**

Source: CARB 2012.
Notes: SDAB = San Diego Air Basin; VOC = volatile organic compounds; CO = carbon monoxide; NO_x = oxides of nitrogen; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.

3.2.7 Noise

Noise, which can be defined as unwanted or undesired sound, is generally considered disturbing or annoying to humans because of its pitch or loudness. Pitch is the property of sound that fluctuates with variation in the frequency of vibration. Higher-pitched signals sound louder to humans than sound with a lower pitch. Loudness is the intensity of sound waves combined with the reception characteristics of the ear. The impacts of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in the extreme, hearing impairment. The combination of noise from all sources near and far is defined as the ambient noise level.

Several noise measurement scales are used to describe noise in a particular location. The decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. Because the human ear is not equally sensitive to all frequencies within the sound spectrum, a method called "A-weighting" is used to filter noise frequencies that are not audible to the human ear. The A-weighted decibel (dBA) noise scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Noise-sensitive receptors generally include land uses associated with indoor and outdoor human activities that may be subject to stress and/or interference from noise. These include single and multiple-family residences and associated outdoor use areas; mobile homes; hotels and motels; hospitals, nursing homes, and other related medical care facilities; educational facilities; libraries; churches; parks; or other places where the public gathers. Wildlife protection areas can also be considered noise-sensitive receptors, especially during the breeding season.

A variety of noise sensitive receptors surround the general vicinity of the South San Diego Bay Unit of the San Diego Bay NWR, including the San Diego Bay NWR itself. Other receptors include a mobile home park located to the south of the Otay River floodplain within the City of San Diego, residential uses and an elementary school located along the south end of the San Diego Bay within the City of Imperial Beach, residential units scattered among small industrial uses to the east of Pond 15, and residential development located just to the west of the San Diego Bay NWR boundaries in the City of Coronado.

The State of California recognizes the relationship between noise and noise-sensitive land uses, and emphasizes the need to control noise at the local level through land use regulation. Section 65032(g) of the California Government Code requires that each city have a Noise Element as part of its General Plan. Grading activities associated with the three proposed alternatives would be subject to the noise standards and or guidelines adopted by the City of San Diego and the City of National City. These jurisdictions have both adopted construction noise standards that would be applicable, such as limitations on the hours when construction can occur, maximum allowable noise levels, or both. In addition to specific standards, these noise elements include restrictions on noise that is disturbing, excessive, offensive, and causes discomfort or annoyance to a reasonable person of normal sensitivity.

The City of San Diego's noise ordinance codified in the Municipal Code, Section 59.5.0404, states that it is unlawful to engage in construction activities between the hours of 7 p.m. of any day and 7 a.m. of the following day, or on legal holidays (City of San Diego 2010). Residential uses south of the San Diego Bay in the City of Imperial Beach have construction noise limits of 75 dBA for any use, and construction is prohibited from 10 p.m. to 7 a.m. Residential uses in the City of Coronado have a construction noise limit of 7 p.m. to 7 a.m. Noise levels within the Otay River Floodplain Site are influenced most heavily by aircraft activity, boating on the San Diego Bay, vehicular traffic on the I-5 and SR-75, and pedestrians and bicyclists using the Bayshore Bikeway. Noise levels on the Pond 15 Site are influenced by the South Bay Salt Works operation.

3.2.8 Climate Change and Sea-Level Rise

Climate Change

Climate change is defined as any change in climate over time, whether due to natural variability or as a result of human activity. Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale (CEQ 2016). General scientific consensus acknowledges the evidence that measurable changes to the climate are occurring, as indicated by increases in global surface temperature, altered precipitation patterns, sea-level rise, more frequent and severe extreme weather events, and ocean acidification (CRC and IRG 2009). Changes in current climate patterns are likely to create irreparable consequences, especially along the vulnerable coastline, where the project site is located. Projected impacts include accelerated coastal erosion, flooding, shifts in abundance and distribution of marine habitat, loss of coastal ecosystems, degradation of species and biodiversity, and the accelerated spread of invasive species (CRC and IRG 2009).

Projections of mean sea-level rise to the year 2100 are characterized by high uncertainty because of the difficulty in modeling melting ice-sheet dynamics and other ocean processes. Global sea level has risen 1.8 millimeters per year (0.07 inches/year) between 1961 and 1993, and 3.1 millimeters per year (0.12 inches/year) since 1993 (IPCC 2007). Recent Southern California sea-level rise projections range from 44 to 166 centimeters (17 to 65 inches) by 2100, with a mean increase of 93 centimeters (37 inches) (NRC 2012).The U.S. Fish and Wildlife Service (Service) has a specific strategy for National Wildlife Refuge System planning with respect to climate change (Czech et. al. 2014). The Refuge System Policy 601 FW 3 requires the maintenance of historical conditions to maintain biological integrity, diversity, and environmental health. Historic conditions are defined as "composition, structure, and function of ecosystems resulting from natural processes that we believe, based on sound professional judgement, were present prior to substantial human related changes to the landscape" (Czech et. al 2014).

Executive Order S-13-08, signed by California Governor Edmund G. Brown Jr. on November 14, 2008, directs State agencies to consider a range of sea-level rise future scenarios for the years 2050 and 2100 in order to assess a proposed project's vulnerability, reduce expected risks, and increase project resiliency to sea-level rise.

The State of California Sea-Level Rise Guidance Document (State Guidance; State of California 2013) was developed by the Coastal and Ocean Working Group of the California Climate Action Team, with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust, and includes sea-level-rise scenarios for both 2050 and 2100. Sea-level-rise projections within the State Guidance, using a Year 2000 baseline, include a rise in ocean level of 4.68 to 24 inches for the area south of Cape Mendocino by 2050. In addition, in 2015, the California Coastal Commission adopted sea-level-rise policy guidance using these same projections, further validating this approach (Commission 2015).

A study of sea-level-rise adaptation strategies for the San Diego Bay by the International Council for Local Environmental Initiatives notes that the greatest cause for concern in the region is the increase in potential flooding due to waves, storm surge, El Niño events, and high tidal fluctuations. The study notes that the Bay has become more vulnerable to regularly occurring inundation, and planning efforts should take into account more common and more severe extreme weather events (ICLEI 2012).

Sea level has been documented in the San Diego Bay since 1906, showing a rise of 8.16 inches (0.67 feet) over the last century (NOAA 2013), which has created inundation in areas directly adjacent to rising water levels. Inundation refers to a condition when land that was once dry becomes permanently wet. Sea level inundation is anticipated to cause the landward migration of intertidal and upland natural environments, such as marshes, tidal flats, and dunes. However, if there is nowhere for these features to migrate due to adjacent development, then inundation could result in the complete loss or fracturing of these systems.

San Diego Climate

The Otay River Watershed has a semi-arid climate typical of Southern California, with dry summers and relatively wet winters. Temperatures are generally mild throughout the year and rain generally occurs during the winter months, as summarized in Table 3.2-7.

Table 3.2-7
Monthly Average Temperature and Precipitation for San Diego

Month	Monthly Average Temperature (°F)	Monthly Average Precipitation (inches)
January	56.4	2.00
February	57.4	1.98

Table 3.2-7
Monthly Average Temperature and Precipitation for San Diego

Month	Monthly Average Temperature (°F)	Monthly Average Precipitation (inches)
March	58.9	1.63
April	61.1	0.78
May	63.3	0.21
June	65.9	0.05
July	69.6	0.02
August	71.0	0.06
September	69.8	0.17
October	66.1	0.51
November	61.4	0.97
December	57.2	1.77
Annual	63.2	10.13

Source: WRCC 2012.

As outlined in Section 3.2.2, Geology, Soils, and Agricultural Resources, the Pacific Ocean is the main driver for climate in San Diego County. Local flooding is a result of intense thunderstorms or tropical storms traversing the Pacific Ocean. The average annual precipitation in the Otay River Watershed generally ranges from 10 to 20 inches per year, and the highest annual precipitation occurs in the mountain ranges in the eastern portion of the County (see Figure 3.2-5).

Differences in monthly and annual precipitation across the Otay River Watershed are shown in Table 3.2-8 for three regions: coastal, inland, and mountain. Based on gauge elevations, three NOAA cooperative stations monitored by the Western Regional Climate Center were selected to represent conditions of the three regions within the Otay River Watershed. Coastal precipitation was represented by the gauge at the San Diego WSO Airport (COOP 047740), inland precipitation in the central portion of the watershed was characterized by the gauge at the Lower Otay Reservoir (COOP 045162), and precipitation in the mountain region was classified using the Barrett Dam gauge (COOP 040514). Elevations of these stations are approximately 10 feet, 520 feet, and 1,620 feet amsl, respectively.

Table 3.2-8
Monthly Precipitation by Region

Month	Coastal Precipitation[a] (inches)	Inland Precipitation[b] (inches)	Mountain Precipitation[c] (inches)
January	2.00	2.12	3.18
February	1.98	1.16	3.56
March	1.63	2.28	2.93
April	0.78	1.09	1.77
May	0.21	0.32	0.64

Table 3.2-8
Monthly Precipitation by Region

Month	Coastal Precipitation[a] (inches)	Inland Precipitation[b] (inches)	Mountain Precipitation[c] (inches)
June	0.05	0.03	0.07
July	0.02	0.02	0.11
August	0.06	0.10	0.20
September	0.17	0.03	0.28
October	0.51	0.48	0.73
November	0.97	0.97	1.44
December	1.77	2.46	2.86
Annual	**10.13**	**11.07**	**17.77**

Source: WRCC 2012.
Notes:
[a] Data from San Diego WSO Airport – COOP 047740 (1914–2012).
[b] Data from Lower Otay Reservoir – COOP 045162 (1940–1956).
[c] Data from Barrett Dam – COOP 040514 (1913–1980).

Tidal Fluctuation

The flow of sea water into and out of the Otay River Channel, the South Bay Salt Works, and the proposed restoration tidal basins are driven by the tidal variation in the San Diego Bay's water level. The nearest NOAA tide gauge to the Otay River and South Bay Salt Works is located at the Navy Pier in San Diego Bay. This tide gauge (NOAA No. 941-0170) was last leveled using the 1983–2001 tidal epoch. Elevations of tidal datums, referenced to the North American Vertical Datum of 1988 (NAVD 88), are given in Table 3.2-9.

Table 3.2-9
Tidal Datums for San Diego Bay at NOAA No. 941-0170 Navy Pier

Category	Elevations
Highest Water Level (01/27/1983)	8.14 feet NAVD
Mean Higher High Water	5.73 feet NAVD
Mean High Water	4.98 feet NAVD
Mean Tide Level	2.96 feet NAVD
Mean Sea Level	2.94 feet NAVD
Mean Low Water	0.94 feet NAVD
North American Vertical Datum	0.433 feet NAVD
Mean Lower Low Water	−0.00 feet NAVD
Lowest Water Level (12/17/1937)	−3.09 feet NAVD

Source: Appendix G.

Mean diurnal tidal ranges are 5.73 feet, compared to 5.33 feet on the open coast, an increase of 0.4 inches of diurnal range in the San Diego Bay. The extreme water level range is 11.23 feet in the San Diego Bay, compared to 10.51 feet on the open coast, an increase of 0.72 feet of extreme range in the Bay.

One additional monitoring station, the Otay River Sonde, has operated a self-recording water quality monitoring station since 2007 at the mouth of the Otay River. Along with salinity and dissolved oxygen, this self-recording device measured water level from December 2007 to December 2011. This monitoring station notes the same mean tide level but maximum and minimum levels are higher, indicating a low tide muting in the extreme southern end of the San Diego Bay.

3.2.9 Greenhouse Gases

The Greenhouse Effect

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Without it, the temperature of the Earth would be about 0°F (−18°C) instead of its present 57°F (14°C). If the atmospheric concentrations of GHGs rise, the average temperature of the lower atmosphere will gradually increase. Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect.

Greenhouse Gases

GHGs include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, water vapor, hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. A summary of the most common GHGs and their sources is included in the following text.

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans, volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 are from the combustion of coal, oil, natural gas, and wood.

Methane. CH_4 is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and the use of N_2O as a propellant (such as in rockets, racecars, aerosol sprays).

Fluorinated Gases. Fluorinated gases are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Several prevalent fluorinated gases include the following:

Hydrofluorocarbons. HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals that are used as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.

Hydrochlorofluorocarbons. HCFCs are compounds containing hydrogen, fluorine, chlorine, and carbon atoms. HFCs are synthetic chemicals that are used as alternatives to ozone depleting substances (chlorofluorocarbons).

Perfluorocarbons: PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, along with HFCs, to the ozone depleting substances. The two main sources of PFCs are primarily aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.

Sulfur Hexafluoride: SF_6 is a colorless gas that is soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016b). The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons of CO_2 equivalent (MT CO_2E).

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 *Intergovernmental Panel on Climate Change Synthesis Report* (IPCC 2014) indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2005). The primary effect of global climate change has been a 0.2°C rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights. Shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year. Sea levels have risen, and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra Nevada snowpack, which accounts for approximately half of the surface water storage in California, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late twenty-first century in central, and most notably, Southern California. By the late century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

Wildfire risk in California will increase as a result of climate change. Earlier snowmelt, higher temperatures, and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning. However, human activities will continue to be the biggest factor in ignition risk. It is estimated that the long-term increase in fire occurrence associated with a higher emissions scenario is substantial, with increases in the number of large fires statewide ranging from 58% to 128% above historical levels by 2085. Under the same emissions scenario, estimated burned area will increase by 57% to 169%, depending on the location (CCCC 2012).

Reduction in the suitability of agricultural lands for traditional crop types may occur. While effects may occur, adaptation could allow farmers and ranchers to minimize potential negative effects on agricultural outcomes by adjusting timing of plantings or harvesting and changing crop types.

Public health-related effects of increased temperatures and prolonged temperature extremes, including heat stroke, heat exhaustion, and exacerbation of existing medical conditions, could be particular problems for the elderly, infants, and those who lack access to air conditioning or cooled spaces (CNRA 2009).

Contributions to GHG Emissions

Per the EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2014 (2016b), total United States GHG emissions were approximately 6,870.5 MMT CO_2E in 2014. The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 80.9% of total GHG emissions (5,556.0 MMT CO_2E). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.7% of CO_2 emissions in 2014 (5,208.2 MMT CO_2E). Total United States GHG emissions have increased by 7.4% from 1990 to 2014, and emissions increased from 2013 to 2014 by 1.0% (70.5 MMT CO_2E). Since 1990, United States GHG emissions have increased at an average annual rate of 0.3%; however, overall, net emissions in 2014 were 8.6% below 2005 levels (EPA 2016b).

State of California

According to California's 2000–2014 GHG emissions inventory (2016 edition), California emitted 441.5 MMT CO_2E in 2014, including emissions resulting from out-of-state electrical generation (CARB 2016b). The sources of GHG emissions in California include transportation, industry, electric power production from both in-state and out-of-state sources, residential and commercial activities, agriculture, high global-warming potential substances, and recycling and waste. The California GHG emission source categories and their relative contributions in 2014 are presented in Table 3.2-10.

Table 3.2-10
GHG Sources in California

Source Category	Annual GHG Emissions (MMT CO_2E)	Percent of Total[a]
Transportation	159.53	36%
Industrial uses	93.32	21%
Electricity generation[b]	88.24	20%
Residential and commercial uses	38.34	9%
Agriculture	36.11	8%
High global-warming potential substances	17.15	4%
Recycling and waste	8.85	2%
Totals	**441.54**	**100%**

Source: CARB 2016b.
Notes: Emissions reflect the 2014 California GHG inventory.
MMT CO_2E = million metric tons of carbon dioxide equivalent per year
a Percentage of total has been rounded, and total may not sum due to rounding.
b Includes emissions associated with imported electricity, which account for 36.51 MMT CO2E annually.

During the 2000 to 2014 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 13.9 MT per person to 11.4 MT per person in 2014, representing an 18% decrease. In addition, total GHG emissions in 2014 were 2.8 MMT CO_2E less than 2013 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is on track to meet the 2020 target of 431 MMT CO_2E (CARB 2016b).

Port of San Diego Climate Action Plan

Due to a small amount of construction activity that would be conducted within the ~~0.79~~1.30-acre portion of the Pond 15 Site for the inlet/outlet levee breach, the project would be subject to the Port of San Diego Climate Action Plan (CAP) (Port 2013). The Port's CAP serves as the long-range planning document for the reduction of GHG emissions within the Port's jurisdiction using 2006 as the baseline level from which to reduce future emission levels. Baseline and future projected GHG emission inventories as disclosed in the CAP show that primarily sources of GHG emissions resulting from Port activities include on-road transportation (e.g. passenger vehicles and trucks), off-road transportation (e.g. maritime operations including large marine vessels and smaller boats), electricity, natural gas and to a smaller extent, water use and solid waste. The CAP identifies emission projections for the years 2020, 2035, and 2050 and established emission reduction targets of 10% below 2006 baseline levels by 2020 and 25% below 2006 levels by 2035. To achieve these reduction targets, the CAP has established a number of policies and measures aimed at reducing emissions associated with the following categories: Transportation and Land Use, Energy Conservation and Efficiency, Water Conservation and Recycling, Alternative Energy Generation, Waste Reduction and Recycling and Miscellaneous (e.g. programs and outreach efforts).

3.2.10 Contaminants

The following technical reports were reviewed in preparation of this section, and applicable information from these reports is incorporated into the discussion that follows.

- *Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year and 50-Year Floods* prepared by S.A. Jenkins, PhD, Y. Poon, DSc, C. Zeeman, PhD, and C. Roberts in October 2015 (Appendix I).
- *Sediment Characterization Sampling and Analysis Report: South San Diego Salt Ponds 12, 13, 14, and 15* prepared by Anchor QEA (updated in 2017 ~~2013~~) (Appendix F1).
- *Sampling and Analysis Report: Otay River Estuary Restoration Soil Characterization Program* prepared by Anchor QEA (updated in 2017 ~~2013~~) (Appendix F2).

Contaminants are both anthropogenic (human caused) and naturally occurring substances that may be individually toxic or may trigger negative impacts to ecosystems by alteration of normal biochemical processes. Contaminants may include pesticides, such as dichlorodiphenyl-trichloroethane (DDT) and chlordane; industrial chemicals and byproducts, such as polycyclic aromatic hydrocarbons (PAHs), PCBs, and dioxins; and metals and toxic elements, such as mercury and lead. Contaminants can alter reproductive system function in adult animals and affect early life stages of fish, mammals, and birds, along with a variety of other potential impacts.

The Otay River Floodplain Site receives urban and stormwater runoff from upstream industrial, commercial, and residential areas. In addition, past agricultural and industrial uses within the project site boundaries and ongoing land uses adjacent to the San Diego Bay NWR are known to have introduced contaminants. A sewage treatment plant, with associated sewage holding ponds, operated within the Otay River floodplain between the mid-1950s and early 1960s. In addition, farming occurred on the site at a time when it was legal to use DDT on crops to control pests. These uses are considered potential sources of various heavy metals and/or DDT and associated metabolites dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethylene (DDE) in the soil. In addition, activities associated with commercial solar salt pond production on and near the project site may have resulted in the introduction of various contaminants.

With respect to the Pond 15 Site, the commercial solar salt operation may also have resulted in the introduction and build-up of various contaminants, especially through the solar salt evaporation process. Another potential source of contaminants was the South Bay Power Plant, which discharged water directly from a test desalination unit into Pond 15 between the late 1960s and early 1970s.

The Service's contaminants specialists, in cooperation with the U.S. Geological Survey, Biological Resources Division's Biomonitoring of Environmental Status and Trends Program, have developed tools such as the Contaminants Assessment Process to evaluate threats of contamination to wildlife and vegetation communities on the National Wildlife Refuges as well as other Service lands. The Contaminants Assessment Process provides a standardized approach for documenting and assessing contaminant threats to land and biota and involves two primary components: a retrospective analysis of known and suspected contaminant sources and contaminated areas, and the investigation of existing or potential contaminant transport pathways. In 2004, a Contaminants Assessment Process was completed for the South San Diego Bay Unit of the San Diego Bay NWR, where both portions of the project site are located. The Contaminants Assessment Process recommended the development and implementation of a sampling plan to characterize (1) the nature and extent of contamination within the sediments, surface water, and brine invertebrates within the salt pond system and (2) the nature and extent of DDT and associated metabolites and TPH in surface and subsurface soils in the upland portions of the NWR.

Pursuant to California Water Code Section 13393, the California State Water Resources Control Board has developed the following sediment quality objectives for toxic pollutants for California's enclosed bays and estuaries:

- Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities in bays and estuaries of California. This narrative objective is to be implemented using the integration of multiple lines of evidence.
- Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health.

These objectives are relevant to the current project because restoration in accordance with the action alternatives would expand tidal and intertidal habitat in the San Diego Bay.

Anchor QEA, in coordination with the Service's Carlsbad Fish and Wildlife Office, Environmental Contaminants Division (Carlsbad Environmental Contaminants Division), prepared sampling and analysis plans to present the approach and methods for assessing the nature and extent of potential contamination within the project sites. Anchor QEA then implemented a soil characterization program, based on the sampling and analysis plans, to evaluate the magnitude, extent, and variability of physical and chemical soil and sediment properties throughout the area proposed for restoration. The final sampling and analysis reports are provided within Appendices F1 and F2 of this Environmental Impact Statement.

Additional contaminants information for the Pond 15 Site is provided in a preliminary sediment investigation report prepared by Tetra Tech (2012) for the Port of San Diego.

For the proposed action, soil is defined as geologically derived material (sand to boulders) that occurs in dry upland settings. Sediment is a mixture of soil and other particles that occurs in aquatic settings. This distinction is made because soil and sediment differ in physical and chemical characteristics that govern their suitability as substrate for biological communities and control the fate and effects of contaminants.

The information outlined below is a summary of the analysis and results presented within the technical reports included in Appendices F1, F2, and I, as well as in the Tetra Tech 2012 report. To help the reader better understand the terminology related to contaminants analysis, the following definitions have been provided.

Elevated: Concentrations of constituents observed in soils and sediment are determined to be elevated based on comparisons with ambient concentrations and/or risk-based screening levels.

Ambient: Ambient concentrations are those that are typical for the area, absent influences of known point sources. The term "ambient" refers to local ambient conditions, with some influence from area-wide sources; for example, lead concentrations in soils from historic automobile emissions.

Risk-Based Screening Levels: Risk-based screening levels are conservatively derived, contaminant-specific concentrations below which there is little to no concern and above which further consideration may be needed, such as reevaluating risks using site-specific conditions. Risk-based screening levels are generic and do not consider background. Consequently, risk-based screening levels for some contaminants may be lower than local ambient or regional background concentrations.

It is important to note that concentrations of naturally occurring constituents, such as metals, may be considered elevated if they exceed ambient concentrations. Concentrations of human-made constituents, such as organochlorine pesticides, only need be detected to be considered elevated.

Otay River Floodplain Site

Sampling within the Otay River floodplain included areas within the San Diego Bay NWR located to the west and south of the Otay River Channel. The sampling program was divided into four site subareas, as shown on Figure 3.2-6, Soil Sampling Subareas – Otay River Floodplain Site: (1) the northern portion of former Salt Pond 20A (S1); (2) the former agricultural land to the east of Nestor Creek (S2, S5); (3) the site of a former agricultural storage and supply area (S3); and (4) the site of a former wastewater treatment pond (S6A and S6B). With the exception of the former agricultural storage and supply area, which was sampled to a depth of −6 feet NAVD 88, all upland areas in the Otay River Floodplain Site were sampled to a depth of −8 feet NAVD 88. All sampling points were located in compliance with the Service-approved Sampling and Analysis Plan (Appendix F1), with a few exceptions and deviations required to avoid potentially sensitive biological and cultural resources.

Specific sampling locations within the Otay River Floodplain Site are presented on Figure 3.2-7, Soil Sampling Locations – Otay River Floodplain Site. Soil and sediment composite samples were analyzed for grain size, total solids, TOC, metals, pesticides (i.e., DDT compounds (DDT, DDD, DDE), toxaphene, dieldrin), TPH, PCBs, and SVOCs.

Metals were detected in all surface and subsurface composite samples, with concentrations similar across all areas sampled (referred to as “Subarea 3” in the Sampling and Analysis Report (Appendix F2)), with the exception of composite samples from areas east of Nestor Creek (specifically, sample locations ORFP-7, -9, -10, -11, -12, and -13, as shown on Figure 3.2-7). Samples from this area contained elevated concentrations of metals, including copper, lead, and zinc, relative to ambient levels (Appendix F2). TPH and PAHs were not detected in any samples, and phenols were generally not detected.

No pesticides or PCBs were detected within composite samples from sample locations ORFP-1, -2, -3, -4, -5, and -6, all located to the west of Nestor Creek, as shown on Figure 3.2-7. Samples from the portion of the Otay River Floodplain Site located east of Nestor Creek had measurable concentrations of DDT, toxaphene, dieldrin, and PCBs. The highest concentrations of pesticides were detected within the top three depth intervals of composite samples from the area east of Nestor Creek, as well as in the samples taken from Nestor Creek. PCBs were detected in surface composite samples from sample locations ORFP-7, -9, -10, -11, -12, and -13, all east of Nestor Creek, as shown on Figure 3.2-7. Within the eastern portion of the Otay River Floodplain Site, concentrations of DDT were highest at the surface where detected and decreased with depth, with only a few exceptions. At sample location ORFP-13, as shown on Figure 3.2-7, concentrations of DDTs, chlordane, and toxaphene were highest in the third depth interval. At sample location ORFP-12, concentrations of DDT were similar across all three depth intervals. The highest concentrations of DDT and toxaphene within the Otay River Floodplain Site were detected in the surface of sample locations ORFP-8, -14, -15, and -16 (see Figure 3.2-7 for locations). Dieldrin was only detected at sample locations ORFP-8, -13, and -14.

Within Nestor Creek, concentrations of DDT, chlordane, and toxaphene were highest at the surface and decreased with depth. DDT was detected at both sampling stations; however, substantially higher concentrations were measured at location NC-2 (location shown on Figure 3.2-7). Chlordane and toxaphene were measured only at location NC-2. Samples taken from the Otay River channel detected DDT compounds between elevations of −4 and −6 feet mean lower low water (MLLW) closest to the Bay, and from the mudline to an elevation of −4 feet MLLW further upstream of the Bay near the project site (Appendix F2).

Within Subarea 3 (Figure 3.2-6), concentrations of DDT, chlordane, toxaphene, and dieldrin were highest at the surface and decreased with depth, with the exception of S3-4 (see Figure 3.2-7 for location). At this station, concentrations increased with depth and were highest in the third depth interval. DDT, chlordane, and toxaphene were detected in at least one depth interval of all stations, while dieldrin was detected at only four stations (S3-2, S3-3, S3-6, and S3-7). The highest dieldrin concentrations were measured at the surface at S3-2 and S3-3 (Appendix F2).

SOURCE: Anchor QEA, L.P., 2013

FIGURE 3.2-6

Soil Sampling Subareas–Otay River Floodplain Site

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SOURCES: BING MAPPING SERVICE; ANCHOR QEA, L.P., 2013

FIGURE 3.2-7

Soil Sampling Locations Otay River Floodplain Site

Otay River Estuary Restoration Project EIS

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Based on sampling results, the pesticide concentrations in the top 1 foot of portions of the area to the east of Nestor Creek were determined to exceed the Title 22 (22 CCR 66700) Total Threshold Limit Concentration[2] (TTLC) for total DDTs.

Table 3.2-11 provides an estimate of the average total DDT concentrations within this area based on sampling performed by Anchor QEA (Appendix F2) and the Service's Carlsbad Environmental Contaminants Division.

Table 3.2-11
Total DDT Levels* from Soil Composite Samples in the Otay River Floodplain

Elevation Interval Represented	West of Nestor Creek	East of Nestor Creek	
	Total DDTS (µg/kg‡) in Composite Samples from Northern Portion of Pond 20A (ORFP-1, 2, 3, 4, 5, 6)	*Total DDTS (µg/kg‡) in Composite Samples from Otay River Floodplain (ORFP-7,9,10,11,12,13)*	*Total DDTS (µg/kg‡) in Composite Samples from Otay River Floodplain (ORFP-8,14,15,16)*
Composite Sample A Surface to 1 foot below ground surface	.50†	32†	1340
Composite Sample B 1 foot bgs to +0.4 foot MLLW	< 0.41	15†	59†
Composite Sample C +0.4 foot to -5.6 feet MLLW	< 0.42	< 0.41	2.4†
Composite Sample D -5.6 feet to -7.6 feet MLLW	< 0.41	< 0.43	< 0.41

Source: Anchor QEA, LLC 2017
Notes: See Figure 3.2-7 for Sampling Locations
* Total DDTs (dichlorodiphenyltrichloroethane) are the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
‡ µg/kg = micrograms per kilogram
† reported value is estimated

~~**Table 3.2-11**~~
~~**Average Total DDT Concentrations in the Eastern Portion of the Otay River Floodplain Site by Depth for Samples Analyzed**~~

~~Depth from the Existing Ground Surface (feet)~~	~~Average Total DDT Concentration (µg/kg)~~
~~0–1~~	~~781~~
~~1–3~~	~~52.6~~
~~3–5~~	~~63.0~~

~~**Source:** Appendix I; Zeeman, pers. comm. 2015.~~
~~**Notes:** DDT = dichlorodiphenyltrichloroethane; µg/kg = micrograms per kilogram.~~

2 A TTLC for total DDT is included in 22 CCR 66700 to provide a legal basis for determining the proper disposal of DDT-contaminated soils. Soils with total DDT greater than 1 ppm (1 mg/kg) exceed the TTLC for total DDT and are therefore considered a hazardous waste. If soils that exceed the TTLC for total DDT are to be removed from a site, the soil must be transported to a hazardous waste facility for disposal.

Elevated concentrations of PCBs were observed in surface soils from ORFP-7, -10, -11, and -12 and from a composite surface sample from ORFP-8, -14, -15, and -16. PCBs were also detected in the surface sediments of Nestor Creek.

Pond 15 Site

A broad-based, stratified-random-core sampling approach was used by Anchor QEA (Appendix F1) to characterize Ponds 12, 13, 14, and 15 and surrounding area. This approach, which was approved by the Service, was modeled after sediment characterization of Salt Ponds 10, 10a, and 11 completed by Everest International Consultants and Anchor QEA in 2009. Ten sampling locations were analyzed within the Pond 15 Site, as shown on Figure 3.2-8, Soil Sampling Locations – Pond 15 Site. The study by Anchor QEA (Appendix F1) specifically addressed potential contaminant-related issues for salt pond restoration. Consequently, the study was designed to provide data on the nature and extent of contaminants in the sediments of all four ponds.

Vertical composite samples of the entire core were collected for preliminary chemical analysis. Subsamples representing 1-foot intervals along the core were also collected and archived for future analysis, if necessary. Samples were analyzed for metals (and metalloids), organochlorine pesticides, PCBs, and PAHs. Results of chemical analyses were compared on a sample-by-sample basis with a variety of ecological screening levels. Anchor QEA compared the results of chemical analyses to NOAA's effects range low (ERL) and effects range median (ERM) sediment quality guidelines. Effects range values are helpful in assessing the potential significance of elevated-sediment-associated contaminants of concern in conjunction with biological testing (Long et al. 1995).

The results of chemical analyses were also reviewed by the Service's Carlsbad Environmental Contaminants Division for potential ecological risks associated with sediments in aquatic habitat. The Carlsbad Environmental Contaminants Division has developed risk-based screening levels for multiple ecological receptors, including benthic invertebrates, benthic vegetation, fish, bottom-feeding birds (black scoter (*Melanitta americana*)), consumers of small fish (grebes (*Podiceps* sp., *Podilymbus podiceps*, *Aechmophorus occidentalis*), terns (*Sterna* sp., *Sternula antillarum*, *Thalasseus* sp., *Chlidonias niger*, *Hydroprogne caspia*), and black skimmer (*Rynchops niger*)), consumers of medium-size fish (e.g., pelicans (*Pelecanus* sp.) and sea lion (*Zalophus californianus*)), and herbivores (wigeons (*Anas penelope*, *A. americana*) and turtles (Testudines)) (Zeeman 2004).

AERIAL SOURCE: Bing maps. Contours from U.S. Fish and Wildlife Service.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.
VERTICAL DATUM: NAVD88.

LEGEND:

- #-# Actual Core Sampling Location
- #-# Actual Grab Sampling Location
- Salt Pond Boundary
- 5 Existing Contour
- Pond 15 Site

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SOURCE: Anchor QEA, L.P., 2013

FIGURE 3.2-8
Soil Sampling Locations - Pond 15 Site

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The chemical analyses of the pond sediments detected organic analytes (i.e., pesticides, PCBs, PAHs) infrequently, if at all, and at low concentrations. Chemical analyses indicate that mean concentrations at most individual sampling stations and pond-wide means are below levels of concern for ecological risk and the ambient concentrations in sediments of the south San Diego Bay would not increase once Pond 15 is restored to tidal influence (Zeeman, pers. comm. 2015).

With respect to inorganic compounds, all metals sampled for were detected in the salt pond sediments, with chromium, selenium, silver, and zinc concentrations all less than screening levels in all samples. Arsenic, cadmium, copper, lead, mercury, and/or nickel were individually detected at concentrations greater than screening levels in one or more samples (Appendix F1).

Arsenic and lead concentrations in nearly all samples exceeded the most conservative (lowest) screening levels used by Anchor QEA. The screening level exceeded by arsenic is a human cancer-risk-based value for soils, while the screening level exceeded by lead is a wildlife-risk-based value for sediments. These screening levels were also exceeded by pond-wide mean concentrations. Based on comparisons with screening levels, arsenic may be a contaminant of potential concern for humans exposed to arsenic in sediment used as soil in a residential setting, while lead may be a contaminant of potential concern for ecological receptors exposed to lead in sediment. However, the screening levels in question are conservative and the actual potential for adverse effects is probably much lower than screening level exceedances suggest (Zeeman, pers. comm. 2015). In addition, concentrations of arsenic and lead in pond sediments appear to be comparable to arsenic and lead concentrations in sediments located along the edge of the Bay adjacent to the salt ponds, and all concentrations of arsenic were less than the Southern California regional background level for soil of 12 mg/kg (Chernoff et al. 2008).

While arsenic and lead concentrations in pond sediments exceed the most conservative screening levels, arsenic is below levels of concern for aquatic and aquatic-dependent wildlife. The potential risks to aquatic organisms and aquatic-dependent wildlife associated with the observed concentrations of lead in Pond 15 sediments are probably not distinguishable from risks associated with lead in sediments from the broader south San Diego Bay (Zeeman, pers. comm. 2015).

Mercury concentrations exceeded the most conservative screening level, which are based on risk to California least terns (*Sternula antillarum browni*), in a few samples from Pond 15. Exceedances were small, with concentrations between 0.06 mg/kg and 0.12 mg/kg, as compared with the 0.05 mg/kg screening level. When considering Pond 15-wide mean concentrations of mercury in sediment, concentrations are below the most conservative screening level and as such are below levels of concern for aquatic organisms or aquatic-dependent wildlife (Zeeman, pers. comm. 2015). <u>It should be noted that Pond 15 is currently used as a salt pond, and thus does not support a wide variety of aquatic organisms. Furthermore, the proposed project will result in the</u>

burial of these contaminated sediments, thus significantly decreasing the availability of contaminated sediments, and resulting in a net benefit.

Copper concentrations in samples from Ponds 12 through 14 were very near or below the most conservative screening levels, which are based on risks to benthic invertebrates. In Pond 15, copper concentrations exceeded the most conservative screening level at 6 of the 10 stations. Copper concentrations at 2 stations exceeded the ERL but not the ERM. The pond-wide mean concentration for copper in Pond 15 sediments is between the most conservative screening level and the ERL and is comparable to concentrations observed in neighboring mudflat sediments outside the salt ponds (Zeeman, pers. comm. 2015). While copper concentrations appear to be at levels of concern at a few individual stations in Pond 15, the pond-wide mean copper concentrations do not exceed levels of concern.

Nickel concentrations at 2 of the 10 stations sampled in Pond 15 exceeded more conservative screening levels (ERL and wildlife-risk-based values), but the mean nickel concentration did not. Consequently, nickel concentrations in Pond 15 sediments are below levels of concern.

The Service also considered summary information for Pond 15 provided in a preliminary sediment investigation report prepared by Tetra Tech (2012) for the Port of San Diego as part of a larger investigation of offshore sediments influenced by operations at the former South Bay Power Plant. Although sampling of Pond 15 for the Tetra Tech report only extended to depths of 12 inches, results suggest that copper and nickel may be at levels of concern in Pond 15 surface sediments near the former outfall from the test desalination plant. Concentration ranges reported for copper, lead, and nickel in three 10-centimeter-depth intervals at each of the four stations indicated that upper-end concentrations of all three analytes exceeded the more conservative screening levels (ERLs and wildlife-risk-based). Upper-end concentrations of copper and nickel also exceeded ERMs.

Using some conservative assumptions about reported concentration ranges and the depth of sediments represented by samples, a comparison was made of data from the Tetra Tech study (2012) with data from the Anchor QEA study (Appendix F1). Copper, lead, and nickel concentrations reported by Tetra Tech for the top 30 centimeters of sediment, representing an average value across three depth intervals, are comparable for lead and nickel and with only slightly higher maxima for copper than concentrations reported by Anchor QEA (Zeeman, pers. comm. 2015). Pond-wide mean concentrations estimated from Anchor QEA data (Appendix F1) are little affected by factoring in even upper-end values from the Tetra Tech report, and conclusions about mean copper, lead, and nickel concentrations in Pond 15 sediments remain unchanged from those described above.

3.3 BIOLOGICAL RESOURCES

This section describes the biological resources present from a regional context and at the site-specific level for the Otay River Estuary Restoration Project (proposed action). Descriptions are provided of the vegetation communities, plants, wildlife (e.g., birds, mammals, reptiles, and terrestrial and marine invertebrates), fish, and listed and sensitive species supported within the San Diego Bay National Wildlife Refuge (NWR). The information presented in this section of the environmental impact study (EIS) is based on surveys conducted between February 2011 and July 2011 for the Otay River Floodplain Site and in March 2013 for the Pond 15 Site. An additional survey was conducted in May 2014 to review existing conditions within project features. Focused surveys were conducted in spring and summer 2011 for coastal California gnatcatcher (*Polioptila californica californica*), burrowing owl (*Athene cunicularia*), least Bell's vireo (*Vireo bellii pusillus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), northern harrier (*Circus cyaneus*), light-footed Ridgway's rail (*Rallus obsoletus levipes*), and rare plants (Biological Resources Existing Conditions Technical Report (BTR) for the proposed action, provided in Appendix J to this EIS). This section incorporates by reference the relevant biological resources information from the following three documents:

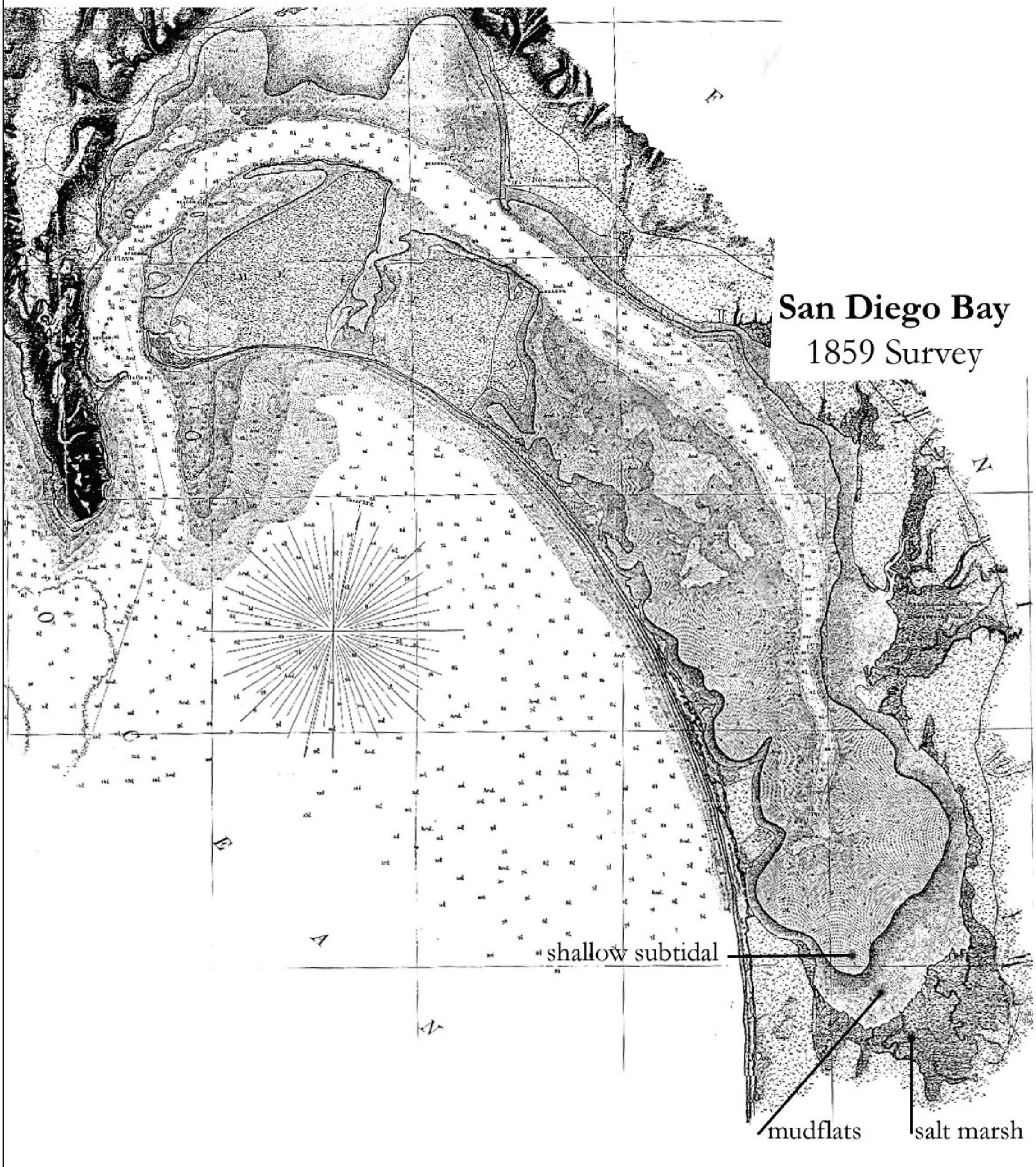
- *Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project South Bay Unit of the San Diego Bay National Wildlife Refuge*, prepared by Dudek in September 2016 (Appendix J).
- *Results of Preliminary Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP), South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge*, prepared by Dudek in March 2015 (included in Appendix J as Appendix B, Results of the Jurisdictional Wetlands Delineation). ~~(Appendix B to the BTR).~~
- *San Diego Bay National Wildlife Refuge Final Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS)*, prepared by the U.S. Fish and Wildlife Service (USFWS 2006a).

3.3.1 Habitat and Vegetation

The approximately 2,300-acre South San Diego Bay Unit of San Diego Bay NWR, which lies at the southern end of San Diego Bay, is managed by the U.S. Fish and Wildlife Service (Service) in accordance with the guidance provided in the San Diego Bay NWR Comprehensive Conservation Plan (USFWS 2006a). The South San Diego Bay Unit consists of portions of San Diego Bay; active solar salt evaporation ponds ~~(~~operated by the South Bay Salt Works~~)~~, which includes the Pond 15 Site; and the western end of the Otay River drainage basin, which includes the Otay River Floodplain Site. The San Diego Bay NWR provides protection for and management of a large number of endangered, threatened, migratory, and native species and their habitats. Nesting, foraging, and resting sites are managed for a number of species of shorebirds, colonial seabirds, and wintering waterfowl. Waterfowl and shorebirds over-winter or pass through, using the area for foraging and resting as they migrate along the Pacific Flyway. Enhanced and restored wetlands, including the San Diego Bay NWR Ponds 10, 10a, and 11 Wetland Restoration Project completed in December 2011, provide high-quality habitat for fish, birds, and plants. Salt marsh vegetation provides habitat to support ~~Federally~~federally and State-listed endangered species such as light-footed Ridgway's rail and Belding's Savannah sparrow. Suitable protected nesting areas, primarily on the levees of the existing salt ponds, are used by the ~~Federally~~federally threatened western snowy plover (*Charadrius nivosus nivosus*), endangered California least tern (*Sternula antillarum browni*), and a number of other ground-nesting seabirds and shorebirds. Within the Otay River Floodplain Site, non-native weeds and exotic grasses dominate the upland portions of the site. The freshwater wetland habitat in the upstream portions of the Otay River contains components of southern willow scrub habitat and a variety of exotic, invasive wetland species such as giant reed (*Arundo donax*), salt cedar (*Tamarix ramosissima*), and castor bean (*Ricinus communis*). This freshwater wetland habitat transitions into salt marsh habitat approximately 1,300 feet upstream of the point where Nestor Creek empties into the Otay River channel.

Prior to the 1900s and human disturbance, survey mapping indicated that the region consisted of coastal salt marsh, intertidal mudflats, and shallow subtidal habitats, as illustrated in Figure 3.3-1, Historical Condition of San Diego Bay (1859) (USFWS 2006a). San Diego Bay was a fertile, shallow, flat-bottomed bay surrounded by extensive mudflats and salt marshes. A narrow channel was present from the mouth of the San Diego Bay to the southern end of Sweetwater Marsh (USFWS 2006a).

Over the past 100 years, significant portions of San Diego Bay, particularly the northern two-thirds of the Bay, have been dredged to support ship movement or were filled to accommodate port development. The channel is deeper and wider than it was originally, with the dredged material used to fill adjacent tidelands. At the southernmost end of San Diego Bay, much of the original salt marsh and intertidal mudflat habitat was diked to create solar evaporation ponds for producing salt. ~~South Bay Salt Works~~The solar salt evaporation pond system, which represents a significant change to the natural habitats of San Diego Bay, is located within the southern end of the historical condition of San Diego Bay. ~~South Bay Salt Works~~This salt pond system consists of diked open water cells with differing levels of salinity. These cells provide roosting habitat for migratory birds, foraging habitat for various shorebirds, and nesting habitat for a number of ground-nesting seabirds (USFWS 2006a). Today, a small percentage of the original salt marsh and intertidal habitat remains. Most of this remaining native habitat is located within the San Diego Bay NWR. The coastal wetlands that remain provide habitat for several ~~Federally~~federally listed endangered and threatened species, and also represent a vital link in the Pacific Flyway. An important byproduct of the commercial salt-making operation is the presence of dense populations of invertebrates (e.g., brine flies, brine shrimp) used as prey items by many species of waterbirds (USFWS 2006a). These conditions continue to be present within the boundaries of the ongoing solar salt operation.



SOURCE: USFWS 2006

FIGURE 3.3-1
Historical Condition of San Diego Bay (1859)

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Vegetation community classifications for the project site were based on the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), as modified by Oberbauer et al. (2008) in the *Draft Vegetation Communities of San Diego County*. The vegetation community descriptions provided by Holland (1986) were used to describe vegetation communities, with modifications, as necessary, to account for site-specific differences between the dominant species in the observed communities compared to the dominant species described by Holland (1986) and classified by Oberbauer et al. (2008).

3.3.1.1 Otay River Floodplain Site

The approximately 33.5-acre Otay River Floodplain Site consists mostly of upland habitat and land covers. Historically, some of these upland areas within the Otay River Floodplain Site supported either freshwater or riparian habitat, but appear to have been predominantly composed of coastal salt marsh habitat (USFWS 2006a). Over time, these wetland areas were converted to upland due to the channelization of the Otay River, the construction of solar salt ponds, and past agricultural activities.

The Otay River Floodplain Site consists of five vegetation communities or land covers, as listed in Table 3.3-1 and shown in Figure 3.3-2, Otay River Floodplain Restoration Site and Project Features Vegetation. Each vegetation community on the project site is described in greater detail below.

Table 3.3-1
Vegetation Communities and Land Cover Types for the Otay River Floodplain Site

Vegetation Community/Land Cover Type	Acreage
Brackish water	0.77
Disturbed habitat	8.68
Former salt pond bottom and borrow area	10.83
Isocoma scrub	11.97
Southern coastal salt marsh	1.26
Total	**33.51**

Source: Appendix J.

Isocoma Scrub

Isocoma scrub is dominated by Menzies' goldenbush (*Isocoma menziesii*). The stands of Isocoma scrub vegetation on the site, which occur to the west of Nestor Creek, form a sparse to open shrub layer. The overall height of these shrubs varies from 0 to 3 feet, and overall vegetation shrub cover is approximately 50%. There are a few patches of coastal cholla (*Cylindropuntia prolifera*) in the community, but the community lacks diversity and is composed of a nearly monotypic stand of Menzies' goldenbush in the shrub layer. The understory is predominantly composed of non-native annual weeds such as stork's bill (*Erodium* spp.), black mustard (*Brassica nigra*), shortpod mustard (*Hirschfeldia incana*), Maltese star-thistle (*Centaurea melitensis*), brome grass (*Bromus* spp.), and wild oats (*Avena* spp.).

Southern Coastal Salt Marsh

Southern coastal salt marsh typically occurs in bays, lagoons, and estuaries along the coast and is subject to tidal inundation. Dominant species include alkali heath (*Frankenia grandifolia*), seablite (*Suaeda* sp.), and Parish's glasswort (*Arthrocnemum subterminale*) along the drier upper edges of the marshes; Pacific pickleweed (*Sarcocornia [Salicornia] pacifica*), Bigelow's pickleweed (*Salicornia bigelovii*), and saltwort (*Batis maritima*) at middle elevations; and California cordgrass (*Spartina foliosa*) at the lowest elevations.

On site, southern coastal salt marsh generally occurs along the banks of the Otay River along the northern edge of the project site, within Nestor Creek, and at the convergence of the Otay River and Nestor Creek. The southern coastal salt marsh on site includes plant species such as seablite, Pacific pickleweed, Parish's glasswort, and California cordgrass.

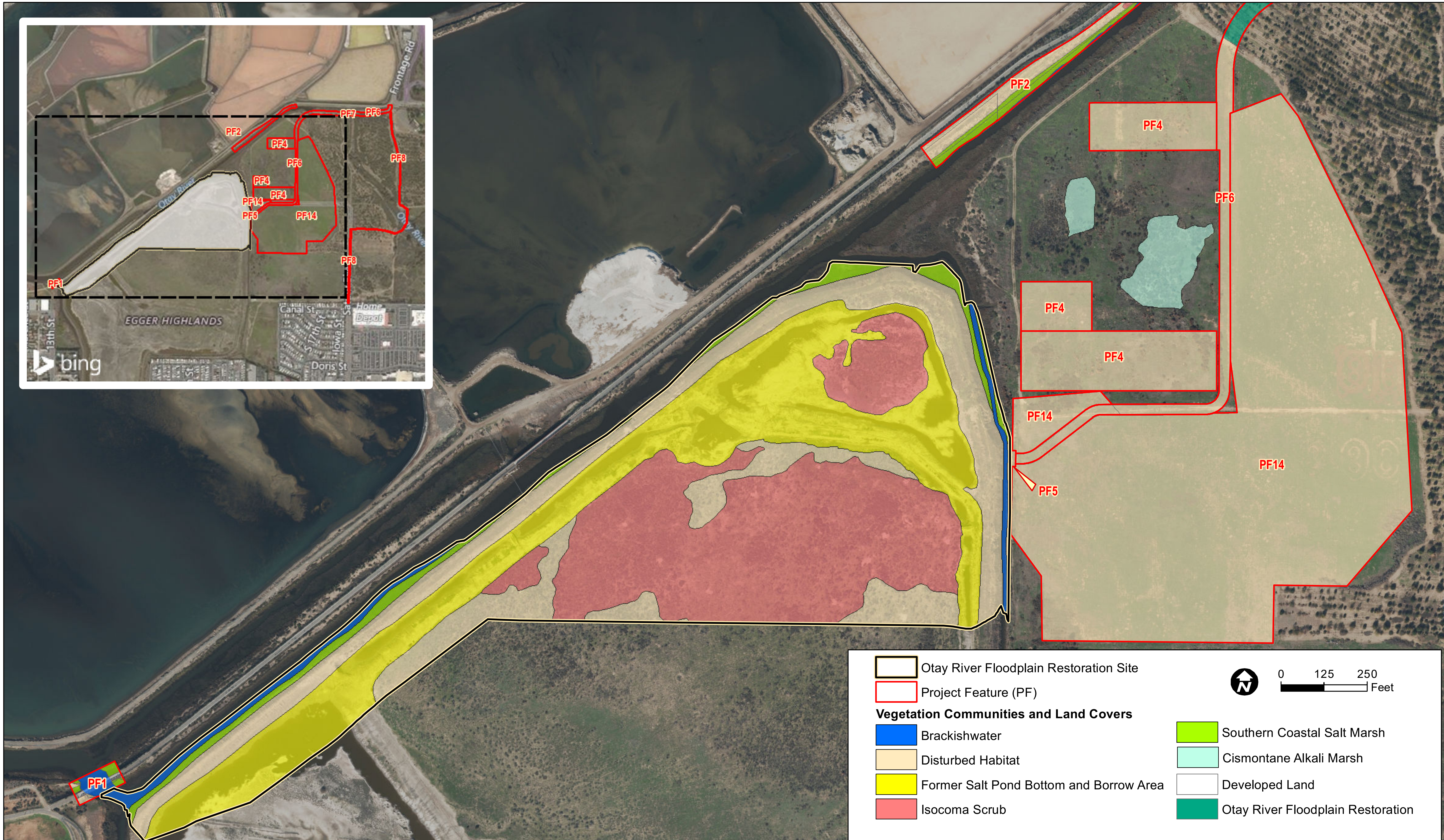
Brackish Water

Brackish water refers to tidal channels that are unvegetated and thus do not fit into other wetland habitat categories. The lack of vegetation may be due to the depth of water; scouring impacts of floods or regular tidal inundation; or human-caused vegetation removal for flood control, access, sand mining, or other purposes.

The brackish water on site receives water from the San Diego Bay with regular tidal inundation, and has a freshwater influence from upstream sources. One channel is located along the northern edge of the site (Otay River channel), and a second is oriented north/south along the eastern edge of the site (Nestor Creek). Within the Otay River Floodplain Site, both channels are subject to regular tidal inundation.

Former Salt Pond Bottom and Borrow Area

The former salt pond bottom and borrow areas consist of a series of low-lying areas that are remnants of former industrial salt evaporation pond construction and operations. The bottom and borrow areas are surrounded by a levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow area). Because of this area's historical long-term use as an industrial salt evaporation pond, the soil conditions are hypersaline, and the land mapped as former salt pond bottom and borrow area does not support vegetation. The former salt pond bottom and borrow areas are located to the south and west of the Otay River and Nestor Creek channels. Within this vegetation type, 4.39 acres were determined to be wetlands or non-wetland waters, the remaining 6.44 acres do not meet the definition of wetlands or non-wetland waters.



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-2

Otay River Floodplain Restoration Site and Project Features Vegetation

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Disturbed Habitat

Disturbed habitat refers to areas that are not developed but generally lack vegetation, and generally are the result of severe or repeated mechanical perturbation. The disturbed habitat on site includes a berm along the northern portion of the site and areas located within the central portion.

3.3.1.2 Pond 15 Site

The Pond 15 Site consists of approximately 91 acres of predominantly open water, including the brines contained in the salt ponds; areas mapped as disturbed habitat such as the salt pond levees and small areas of San Diego Bay; beach; and the native southern coastal salt marsh vegetation community. Prior to diking for salt production, the entire area within the Pond 15 Site was composed of intertidal mudflat.

The Pond 15 Site is part of a larger South Bay Salt Works operation that currently produces salt for commercial purposes using solar radiation to evaporate water from seawater and eventually crystallize the salts through a sequential evaporation technique. The salt evaporation ponds are separated from the adjacent San Diego Bay and tidal channels by levees that surround the ponds. These levees reach a maximum elevation of approximately 8 feet, slightly greater than the highest observed water level (7.71 feet; North American Vertical Datum (NAVD88)). The Pond 15 Site includes the vegetation communities and land covers listed in Table 3.3-2 and shown in Figure 3.3-3, Pond 15 Restoration Site and Project Features Vegetation. Each vegetation community within the project site is described in greater detail below.

Table 3.3-2
Vegetation Communities and Land Cover Types for the Pond 15 Site

Vegetation Community/Land Cover Type	San Diego Bay NWR (acres)	San Diego Unified Port District Lands (acres)	Total Acreage
Bay	—	1.15	1.15
Beach	0.01	—	0.01
Disturbed habitat	2.77	—	2.77
Open water	82.33	—	82.33
Salt pond levee	3.67	—	3.67
Southern coastal salt marsh	0.72	0.15	0.87
Disturbed southern coastal salt marsh	0.10	—	0.10
Total	**89.60**	**1.30**	**90.90**

Source: Appendix J.

Bay

Areas mapped as bay are located outside the salt pond levees and refer to the open water located within San Diego Bay. The Pond 15 Site includes a 1.30~~15~~-acre portion of San Diego Bay located immediately to the north of the area proposed for the Pond 15 levee breach (Figure 3.3-3). Approximately 1.15 acres of the 1.30 acres is designated as “Bay”. This portion of San Diego Bay is managed by the San Diego Unified Port District.

Beach

Beach refers to areas that are on the Bay side of the levees and that are subject to tidal inundation but consist generally of exposed sand. Areas that are mapped as beach are lacking vegetation. Beach areas are infrequently tidally inundated, whereas tidal flat and mudflat areas are inundated on a daily basis.

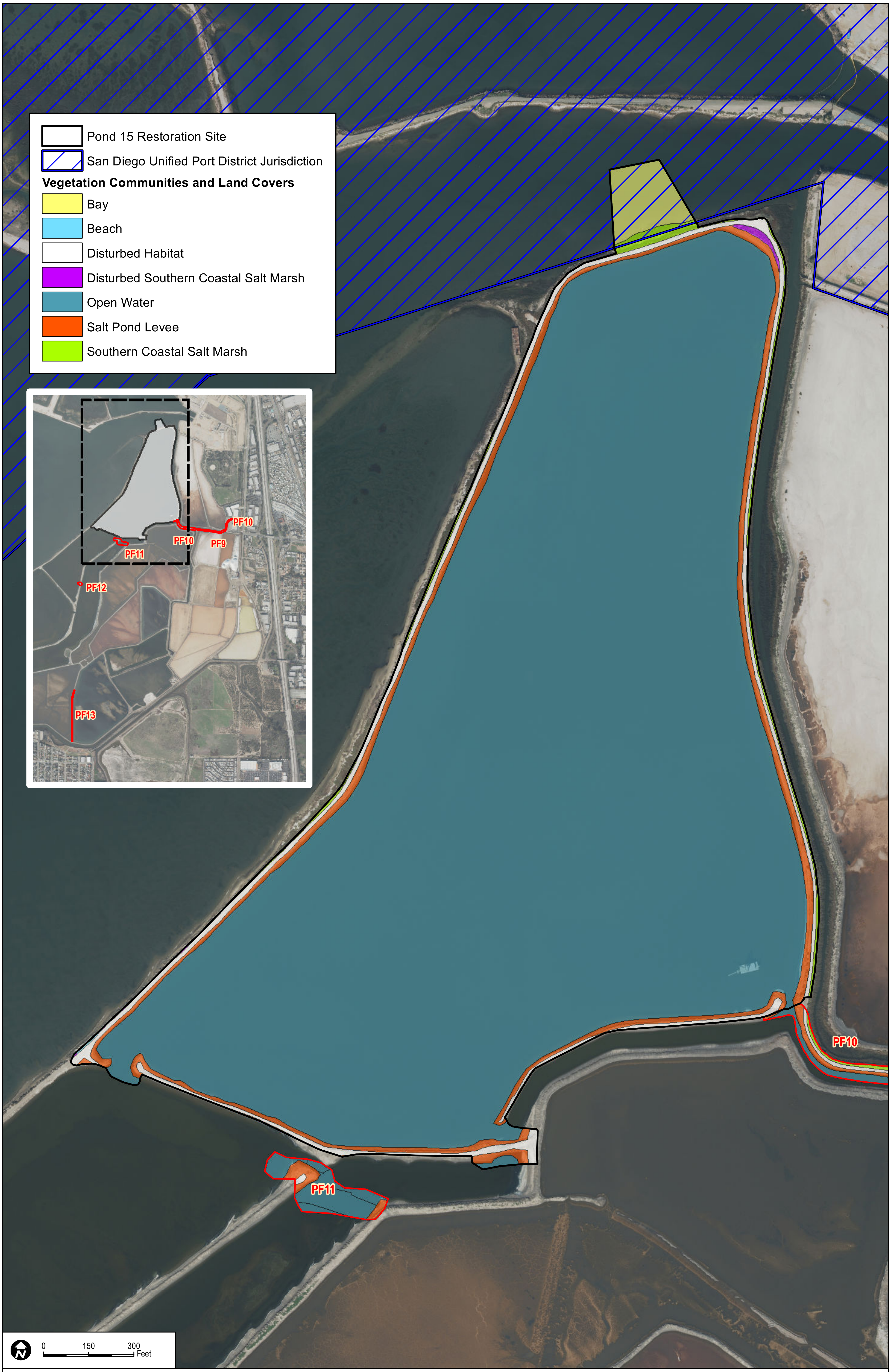
Disturbed Habitat

Disturbed land refers to areas that are not developed but generally lack vegetation and generally are the result of severe or repeated mechanical perturbation. The disturbed habitat on site includes the top surface of the levees surrounding the Pond 15 Site. These areas are used for vehicular access and do not support significant stands of vegetation.

Open Water

Open water consists of concentrated brines found within the South Bay Salt Works and includes all areas within the salt pond complex that are perennially inundated, including Pond 15. The salt pond brines are hypersaline and vary in salinity from pond to pond, depending on each pond’s position in the sequential evaporative water process~~.~~ and the timing associated with seasonal intakes of bay water. The salinity level in each pond also varies throughout the year in response to rainfall, temperature, and other climatic factors.

Overall salinities of the active salt ponds within the South San Diego Bay Unit, which can range from 32 parts per thousand (ppt) to 356 ppt, are substantially higher than salinity levels at the south end of San Diego Bay. Allen (1999) observed that salinities in San Diego Bay varied depending on the location in the Bay and the time of year, with salinities typically higher than 34 ppt, the average value for seawater. As a matter of reference, ocean water salinity varies from 32 to 37 ppt (ONR 2014). In the mid-1990s, recorded salinities in south San Diego Bay varied from 39.8 ppt to 33.4 ppt (Allen 1999). The salinity level in Pond 15 varies from 71.3 to 128.5 ppt (USFWS 2006a).



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-3

Pond 15 Restoration Site and Project Features Vegetation

Otay River Estuary Restoration Project EIS

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Salt Pond Levee

The salt pond levees consist of internal levees that separate the individual salt ponds within the South Bay Salt Works and external levees that separate the solar salt evaporation pond system from the adjacent San Diego Bay. The levees vary in the degree to which they are compacted, with the lower and outer edges less compacted and the surfaces intended for vehicle access more compacted. Areas with less compaction occasionally support disjunct patches of vegetation, and compacted areas are devoid of vegetation. Areas intended for driving access that are devoid of vegetation were classified as disturbed habitat (see above) to distinguish them in the context of regulated versus non-regulated jurisdictional areas. Patchy vegetation occurring on the salt pond levees consists of a combination of native and non-native species. Native species that occur on the levees are typical of middle and upper salt marsh habitat such as salt grass (*Distichlis spicata*), glasswort, and seablite species (*Suaeda* spp.). Non-native species occurring on the levees consist of ice plant (*Mesembryanthemum* spp.), annual grasses (e.g., *Bromus*), and patches of Australian saltbush (*Atriplex semibaccata*).

Southern Coastal Salt Marsh and Disturbed Southern Coastal Salt Marsh

Southern coastal salt marsh typically occurs in bays, lagoons, and estuaries along the coast, and is subject to tidal inundation. Dominant species include seablite species and Parish's glasswort along the drier upper edges of the marshes; Virginia glasswort (*Salicornia depressa*), dwarf saltwort (*Salicornia bigelovii*), and saltwort at middle elevations; and cordgrass closest to the water.

Within the Pond 15 Site, southern coastal salt marsh occurs as small patches of vegetation along the outer levee that separates the salt pond from the San Diego Bay. The Pond 15 Site includes a 0.15-acre patch of southern coastal salt marsh located immediately to the north of the area proposed for the Pond 15 levee breach (Figure 3.3-3). This area is managed by the San Diego Unified Port District. It is classified as a disturbed form of the habitat in areas where there is overall low vegetative cover of the community. The southern coastal salt marsh on site includes seablite species, Virginia glasswort, Parish's glasswort, and cordgrass.

3.3.1.3 Project Features

The proposed restoration activities would focus on the Otay River Floodplain Site and Pond 15 Site. However, several additional project features are required to facilitate the proposed action's restoration activities, including the following (described in detail in Chapter 2):

1. **Otay Channel Protection under Bikeway Bridge.**
2. **Otay Channel Protection.**
3. ~~**Stockpiles.** Within the proposed staging area, two areas encompassing a total of 4.07 acres would be used for stockpiling excavated material.~~ Stockpile areas have been removed.

4. **Staging Area.** Implementation of the proposed action would require a site where the logistics of mobilization and demobilization can occur, and where other activities related to the proposed action can be coordinated.
5. **Crossing at Nestor Creek.** To access the western portion of the Otay River Floodplain Site from the staging area east of Nestor Creek, the contractor would install a crossing across Nestor Creek composed of fill material and associated culverts.
6. **Truck Route Connecting Nestor Creek.** The truck construction access route would be used under ~~any one~~ either of the ~~three~~ construction material transfer alternatives.
7. **Crossing at Otay River.** To access the construction staging area and western portion of the Otay River Floodplain Site from the end of Main Street, the contractor would install a crossing at the Otay River channel.
8. **Bike Path Reroute.** An existing bike path that extends north/south between Saturn Boulevard to the south and Main Street to the north would be rerouted during construction to minimize conflicts between bicyclists and construction vehicles and to ensure user safety.
9. **Crossing at Palomar Channel.** The crossing would be composed of fill material and associated culverts to ensure that the crossing would not create impediments to water flow.
10. **Truck Crossing at Salt Pond Levee.**
11. **Pond 13 and Pond 14 Levee Modifications.** Modifications in the northern areas of these ponds would occur.
12. **Pond 13 and Pond 14 Levee Modifications.** Modifications in the southern areas of these ponds would occur.
13. **Raised Levee between Pond 22 and Pond 23.** The elevation of the levee that extends for approximately 14,000 feet between Ponds 22 and 23 would be raised by 2 feet to a new crest elevation of +13 feet NAVD 88.
14. ~~**Revegetation Area East of Nestor Creek.**~~ **Exposure Reduction Cover.** Excess material from the excavation of the Otay River Floodplain Site would be spread over 23.11 acres to the east of Nestor Creek.~~The area east of Nestor Creek, including the Exposure Reduction Cover, would be revegetated to native vegetation following completion of the proposed action. Stockpiled material on the staging area would partially be used for this revegetation effort.~~

Similar to the Otay River Floodplain Site and Pond 15 Site, most of the project features would occur on disturbed sites that have limited habitat quality, as shown in Table 3.3-3 and Figures 3.3-2, 3.3-3, 3.3-4 (Project Features Vegetation – Otay River Floodplain Site), and Figure 3.3-5 (Project Features Vegetation – Pond 15 Site).

Table 3.3-3 provides a summary of the existing vegetation communities and land cover types associated with the project features.

Table 3.3-3
Vegetation Communities and Land Cover Types for the Project Features

Vegetation Community/Land Cover Type	Project Features (acres)														
	1	*2*	*~~3~~*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackish water	0.13	0.08 ~~20~~	~~–~~	–	–	–	–	–	0.01	–	–	–	–	–	~~0.21~~ 0.22
Developed land	0.02	–	~~–~~	–	–	0.12	0.01	0.74	0.04	0.49	–	–	–	–	1.42
Disturbed habitat	0.03	0.68	~~4.07~~	~~6.06~~ 4.11	0.02	~~1.87~~ 1.96	0.07	0.02	0.04	0.30	0.02	0.02	0.41	~~21.50~~ 23.11	~~35.11~~ 30.79
Salt flat	–	–	~~–~~	–	–	–	–	–	–	0.06	–	–	–	–	0.06
Open water	–	–	~~–~~	–	–	–	–	–	–	0.40	0.79	0.08	0.03	–	1.30
Salt pond levee	–	–	~~–~~	–	–	–	–	–	0.01	0.45	0.19	0.08	0.31	–	1.04
Otay River floodplain ~~restoration~~	–	–	~~–~~	–	–	0.56	–	0.03	–	–	–	–	–	–	0.59
Freshwater marsh	–	–	~~–~~	–	–	–	0.08	–	–	–	–	–	–	–	0.08
Isocoma scrub	–	0.06	~~–~~	–	–	–	–	–	–	–	–	–	–	–	0.06
Mulefat scrub	–	–	~~–~~	–	–	0.06	–	–	–	–	–	–	–	–	0.06
Southern coastal salt marsh	0.06	0.47	~~–~~	–	–	0.02	0.02	–	0.06	0.19	–	–	–	–	0.82
Total	**0.24**	**1.29**	**~~4.07~~**	**~~6.06~~ 4.11**	**0.02**	**~~2.63~~ 2.72**	**0.18**	**0.79**	**0.16**	**1.89**	**1.00**	**0.18**	**0.75**	**~~21.50~~ 23.11**	**~~40.76~~ 36.44**

Project Features

1 Otay Channel Protection under Bikeway Bridge (temporary and permanent)
2 Otay Channel Protection (permanent)
~~3 Stockpiles (permanent)~~
~~3~~ Note: The material that was to be stockpiled will be used to cover a 23.11-acre area of disturbed habitat east of Nestor Creek; see Project Feature 14.
4 Staging Area (temporary)
5 Crossing at Nestor Creek (temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (temporary)
7 Crossing at Otay River (temporary)
8 Bike Path Reroute (temporary)
9 Crossing at Palomar Channel (temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (temporary)
11 Levee Modification of Ponds 13 and 14 – North (temporary and permanent)
12 Levee Modification of Ponds 13 and 14 – South (temporary and permanent)
13 Raised Levee between Ponds 22 and 23 (permanent)
14 ~~Revegetation Area East of Nestor Creek~~Exposure Reduction Cover (permanent)

3.3.1.4 Jurisdictional Waters

The U.S. Army Corps of Engineers (Corps), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (Regional Board), and California Coastal Commission (Commission) regulate certain activities within streams, wetlands, riparian areas, and the coastal zone in California.

U.S. Army Corps of Engineers

The Corps regulates "discharge of dredged or fill material" into waters of the United States, which includes tidal waters, interstate waters, and all other waters that are part of a tributary system to interstate waters or to navigable waters of the United States, the use, degradation, or destruction of which could affect interstate or foreign commerce or that are tributaries to waters subject to the ebb and flow of the tide (33 Code of Federal Regulations 328.3(a)), pursuant to the provisions of Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Corps jurisdiction within rivers and streams extends to the ordinary high water mark. The Corps defines jurisdictional wetlands as areas supporting a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology, in accordance with the procedures established in the Corps' Wetland Delineation Manual (ACOE 1987). However, the United States Supreme Court ruling in the *Solid Waste Agency of Northern Cook County vs. United States Army Corps of Engineers, No. 99-1178* (January 9, 2001) (the SWANCC case) held that the CWA does not give the Federal government regulatory authority over non-navigable, isolated, intrastate waters. Because of this decision, some previously regulated depressional areas such as mudflats, sandflats, wetlands, prairie potholes, wet meadows, playa lakes, natural ponds, and vernal pools, which lack a hydrologic connection to other intra- or interstate waters of the United States, are no longer regulated by the Corps. However, some of these areas (e.g., isolated streams, lakes, or ponds) may still be regulated by CDFW under Section 1600 of the Fish and Game Code, the Regional Board under the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), or the Commission under the California Coastal Act.

For tidally influenced waters, the Corps has two limits to jurisdiction: one for Section 10 and one for Section 404. The shoreward limit to the Corps' regulatory jurisdiction under the Section 10 authorities of the Rivers and Harbors Act in coastal areas extends to the line on the shore reached by the plane of the mean high water, which is 5 feet above mean lower low water (MLLW = 0 datum). The shoreward limit for the regulatory program's jurisdiction under the Corps Section 404 authorities is based on the high tide line, which, in the San Diego Bay, is 7.79 feet above MLLW. If there are wetlands meeting the Corps' criteria abutting or adjacent to the high tide line, then the Corps' jurisdiction under Section 404 extends to the limit of those wetlands.

California Department of Fish and Wildlife

Section 1600 et seq. of the California Fish and Game Code (Streambed Alteration) authorizes CDFW to regulate activities that "will substantially divert, obstruct, or substantially change the natural flow or bed, channel or bank, of any river, stream, or lake designated by [CDFW] in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit." Typically, CDFW takes jurisdiction to the top of bank of a stream or the limit of the adjacent riparian vegetation, referred to in this report as "streambed and associated riparian habitats." Within estuary environments, a "preponderance of evidence" standard is used where it is not readily apparent where Section 1600 jurisdiction ends. Under this standard, the geometry of the water feature, predominant salinity of the waters, composition of vegetation, and predominant fauna are used to determine the limits of CDFW jurisdiction under Section 1600.

Activities are not regulated under Section 1600 of the Fish and Game Code where waters are principally marine, aquatic shorelines are shaped principally by tidal current and wave action rather than by fluvial processes, vegetation is saline marsh and not brackish water or freshwater, and marine fish and invertebrate communities are prevalent. However, CDFW has participated and will continue to participate with the Service in development and review of wetland restoration projects in the San Diego Bay NWR.

Regional Water Quality Control Board

The Regional Board regulates discharging waste, or proposing to discharge waste, within any region that could affect waters of the State (SWRCB 2014), pursuant to provisions of the Porter-Cologne Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (SWRCB 2014). Although the Porter-Cologne Act definition of waters of the State may not apply on ~~Federally~~federally owned land, the Regional Board may still assert jurisdiction over qualifying aquatic resources on land owned by the United States where CWA Section 401 applies. Before the Corps will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the Regional Board.

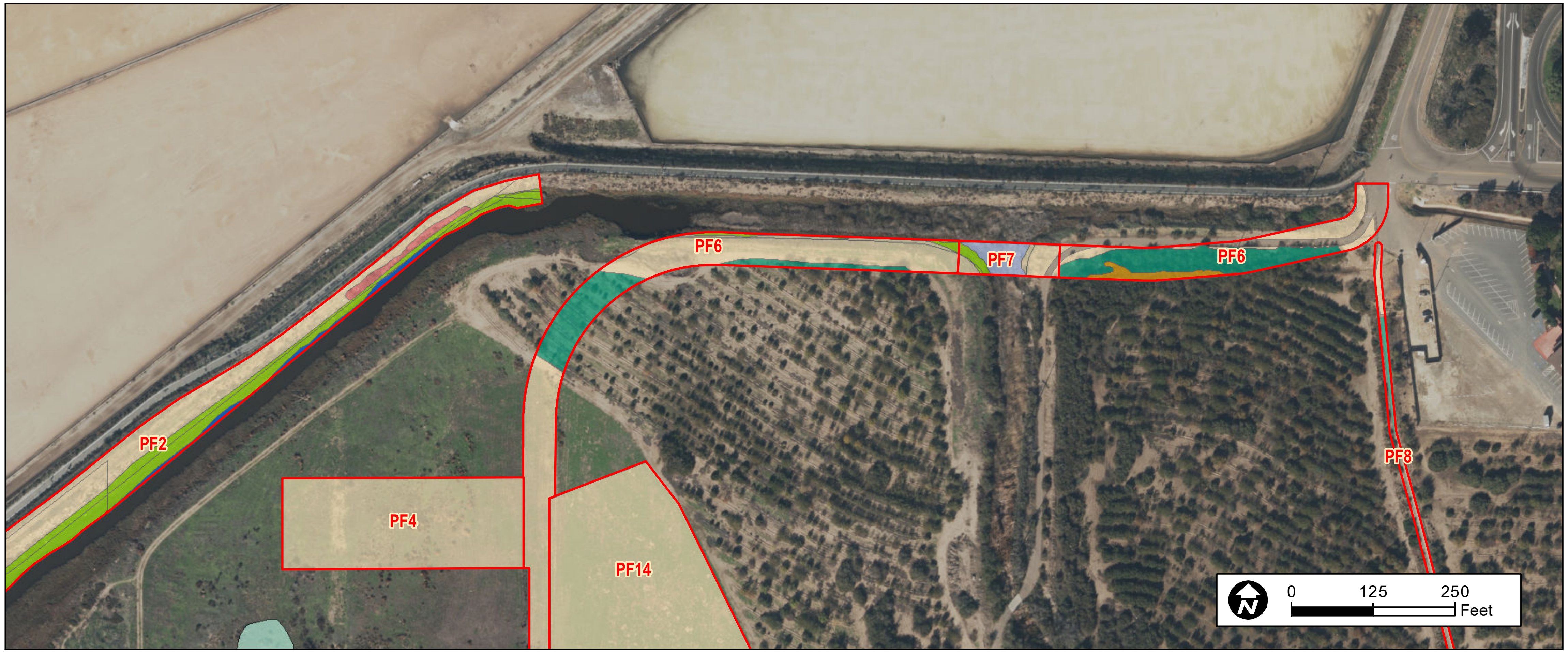
California Coastal Commission

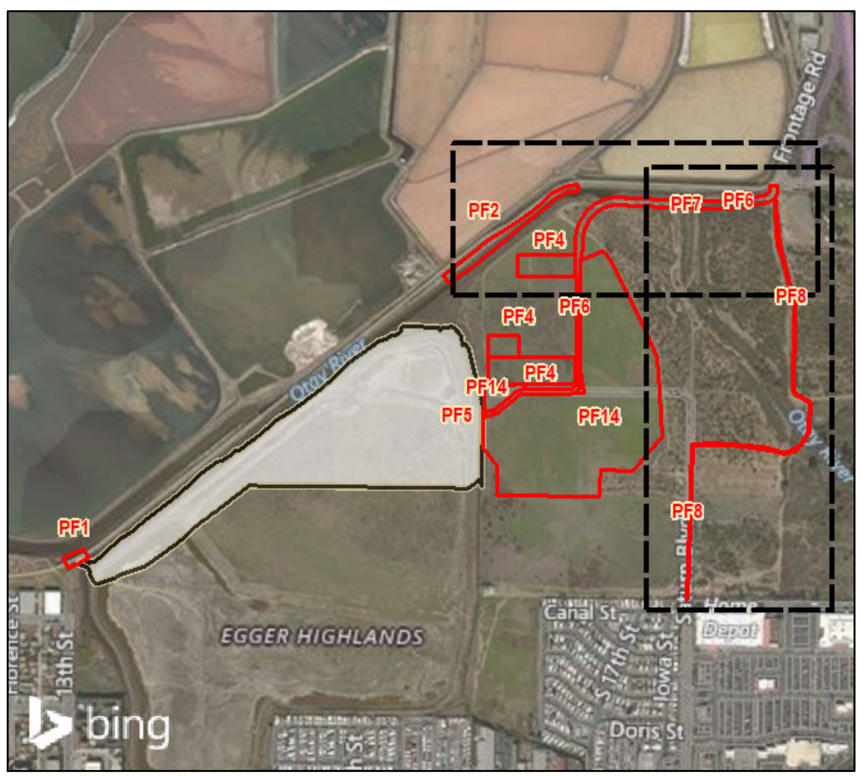
Under the California Coastal Act, the Commission regulates impacts to designated sensitive coastal areas and wetlands in the "coastal zone," and requires a coastal development permit for almost all development within this zone. From 3 miles seaward, the coastal zone extends inland anywhere from several hundred feet up to 5 miles from the mean high tide line.

Section 30240(b) of the California Coastal Act states that development in and adjacent to environmentally sensitive habitat areas be sited and designed to prevent impacts that would significantly degrade those areas. The California Coastal Act also protects wetland areas. Section

30121 of the California Coastal Act defines wetlands as "lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, swamps, mudflats, and fens." The California Coastal Act only allows impacts to wetlands if the three tests of Coastal Act Section 30233(a) are met. The first test requires that the proposed activity fit into one of seven categories of uses, including wetland restoration. The second test requires that there be no feasible, less environmentally damaging alternative. The third test mandates that feasible mitigation measures be provided to minimize a project's adverse environmental effects. In contrast to the Corps, which uses a three-parameter definition to delineate wetlands, the Commission essentially uses the Cowardin method of wetland classification, which defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) (Cowardin et al. 1979).

The Commission's wetland definition is generally more encompassing than either the Corps or CDFW definition in most respects. However, Section 13577(b) of the Commission's Administrative Regulations suggests that where conditions are not capable of supporting hydric soils or hydrophytic vegetation, hydrologic indicators of saturation or surface waters should be expressed on an annual basis ("at some time during each year") rather than under ordinary high water conditions, as is the case under the Federal regulatory standard.





Otay River Floodplain Restoration Site

Project Feature (PF)

Vegetation Communities and Land Covers

- Brackishwater
- Disturbed Habitat
- Former Salt Pond Bottom and Borrow Area
- Isocoma Scrub
- Southern Coastal Salt Marsh
- Cismontane Alkali Marsh
- Developed Land
- Otay River Floodplain Restoration

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-4

Project Features Vegetation

Otay River Estuary Restoration Project EIS

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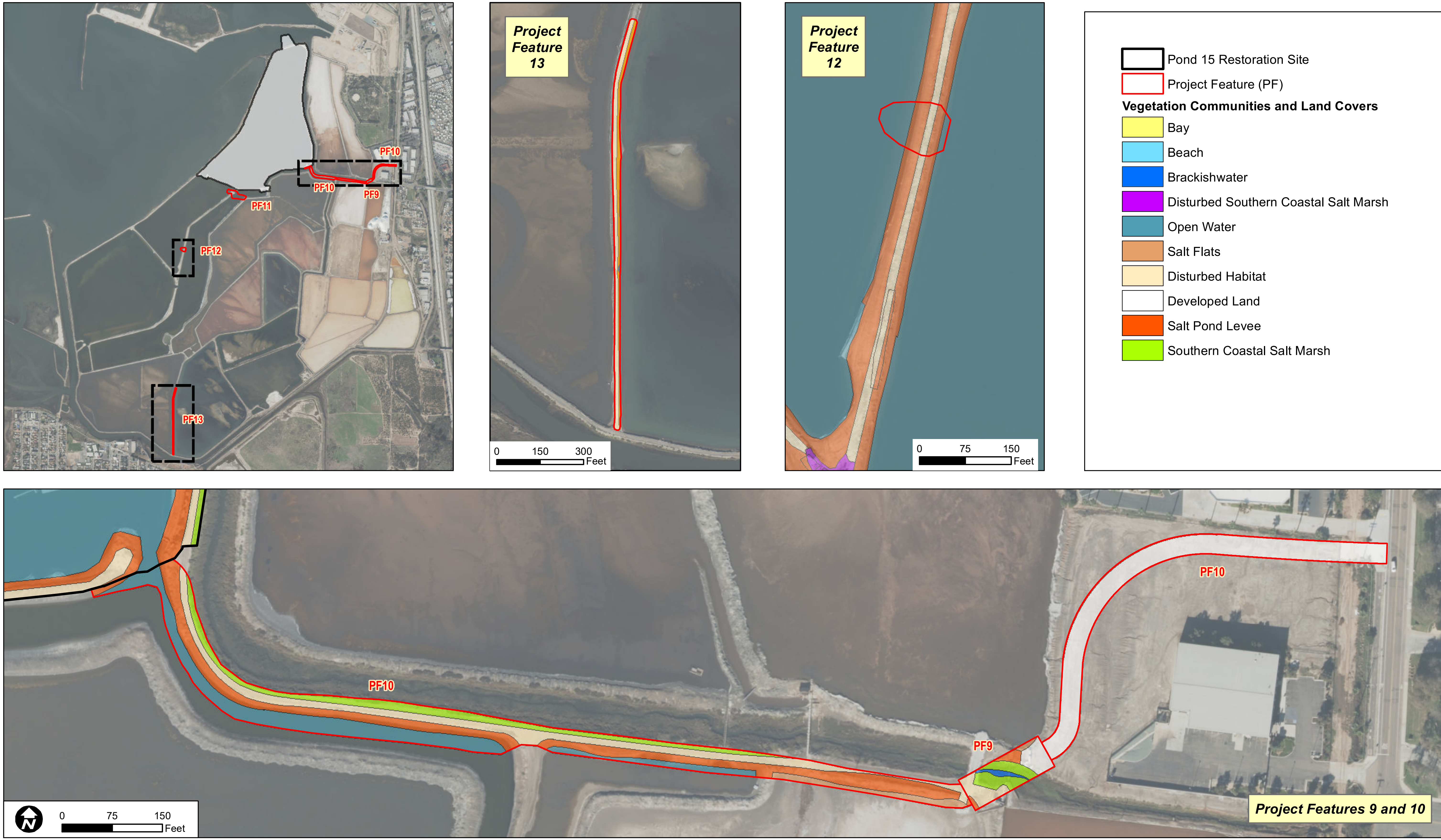

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-5

Project Features Vegetation

Otay River Estuary Restoration Project EIS

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3.3.1.4.1 Otay River Floodplain Site

The jurisdictional delineation identified 6.43 acres of wetlands and non-wetland waters under the joint jurisdiction of the Corps (under the Preliminary Jurisdictional Determination procedures), Regional Board, and Commission (see Table 3.3-4 and Figure 3.3-6, Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation). No areas are under the jurisdiction of the Commission only as determined by a single parameter.

Table 3.3-4
Wetland Delineation Existing Acreage Summary for the Otay River Floodplain Site

Vegetation Community	Jurisdiction *Corps, Regional Board, Commission (acres)*
Non-Wetland Waters ~~Wetlands~~	
Brackish water	0.77 ~~acre~~
Former salt pond bottom and borrow area	3.52 ~~acres~~
Wetlands	
Southern coastal salt marsh	1.26 ~~acres~~
Former salt pond bottom and borrow area	0.87 ~~acre~~
Total	**6.4~~3~~2 ~~acres~~**

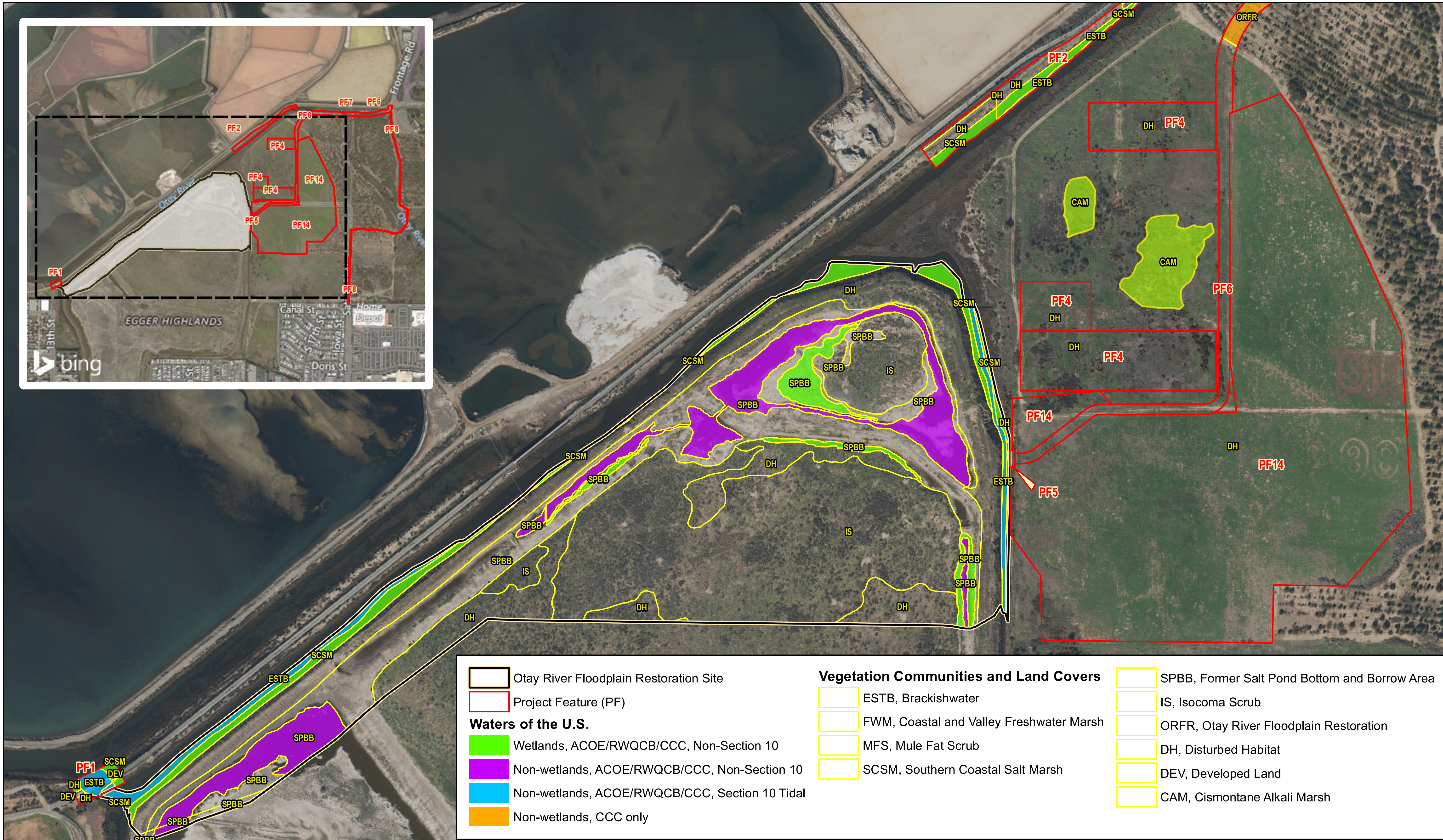
Source: —Included in Appendix J~~.~~ as Appendix B, Results of the Jurisdictional Wetlands Delineation

In general, the predominant native vegetation communities associated with the wetlands are adjacent to tidal channels and support southern coastal salt marsh. Soils in these areas are characterized by variable textures (i.e., clay loam, sand, loam, clay, loamy sand, loamy clay, and sandy clay loam) with redox dark surfaces or a loamy gleyed matrix. Wetland hydrology indicators present are surface water, high water table, and saturation. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands. Additionally, some locations along the tidal channels had a narrow strip along the outer perimeter of the salt marsh habitat where hydrology indicators were not apparent and soils did not have hydric indicators. In these instances, Corps jurisdiction was assumed because they are tidally influenced areas that are below the elevation of the high tide line (7.79 feet above MLLW).

The Otay River Floodplain Site contains a series of low-lying areas that are remnants from the construction and operation of the former industrial salt evaporation pond, as described above. The functions and values of these areas are considered degraded and low due to extensive disturbance, lack of vegetation, lack of surface water hydrologic connectivity, and excessive salinity.

Portions of the former salt pond bottom and borrow area can occasionally become inundated from precipitation, as was the case during the February 2011 site visit. However, with the exception of a few small areas in the southwestern corner, the areas were completely dry during the July 2011 site visit. A review of aerial photographs shows that ponding does not occur every year and varies in location and extent. Although the borrow areas may exhibit periods of ponding during the rainy season, the surface water evaporates quickly.

Although the borrow areas are not physically connected to tidal channels or freshwater channels due to the presence of perimeter berms, the Corps classified them as jurisdictional for the Preliminary Jurisdictional Delineation. The portions of these areas that support hydrophytic vegetation were classified as wetlands, and the remaining areas below the ordinary high water mark were classified as non-wetland waters of the United States. All the borrow areas below the ordinary high water mark met the Commission's definition of a wetland (included in Appendix J, Results of the Jurisdictional Wetlands).



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-6

Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation

Otay River Estuary Restoration Project EIS

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3.3.1.4.2 Pond 15 Site

Based on the wetland delineation conducted by Dudek in March 2013, approximately 88 acres of wetland and non-wetland waters of the United States is under the joint jurisdiction of the Corps, Regional Board, and Commission within the Pond 15 Site. Of this, 1.30 acres is San Diego Unified Port District Lands. The jurisdictional features identified on site are listed in Table 3.3-5 and shown in Figure 3.3-7, Pond 15 Restoration Site and Project Features Jurisdictional Delineation. The jurisdictional features identified are primarily unvegetated, with the exception of one patch along the salt pond levee. Coastal salt marsh is the dominant native vegetation community associated with wetlands on site. When present, vegetation consisted of species typical of southern coastal salt marsh habitat, including estuary seablite (*Suaeda esteroa*), alkali heath, Pacific pickleweed, sea lavender (*Limonium californicum*), and saltwort. Also observed in the southern coastal salt marsh habitat were coast weed (*Amblyopappus pusillus*), non-native slenderleaf iceplant (*Mesembryanthemum nodiflorum*), non-native crystalline iceplant (*Mesembryanthemum crystallinum*), and arrowgrass (*Triglochin maritima*).

Although not present within the Pond 15 Site, an eelgrass (*Zostera*) survey conducted in San Diego Bay in 2014 indicated that eelgrass occurs along the southern edge of the Chula Vista Wildlife Reserve, approximately 850 feet to the west of the northern portion of Pond 15 (NAVFAC and Port 2014). Although the distribution of eelgrass may vary from year to year, the survey indicated a relatively large population within south San Diego Bay (Figure 3.3-8, San Diego Bay 2014 Eelgrass Survey).

The portions of the Pond 15 Site that met all three parameters were classified as wetlands, and the remaining areas below the high tide line (7.79 feet above MLLW) were classified as non-wetland waters of the United States. The top of the salt pond levees is above the high tide line and did not meet the three parameters. Therefore, these areas were mapped as disturbed habitat and were classified as non-jurisdictional.

Table 3.3-5
Pond 15 Site Wetland Delineation Existing Acreage Summary

Vegetation Community	San Diego Bay NWR	San Diego Unified Port District Lands	Total Acres
Non-Wetland Waters ~~Wetlands~~			
Bay	—	1.15	1.15
Beach	0.01	—	0.01
Open water	82.33	—	82.33
Salt pond levee	3.67	—	3.67
Wetlands			
Southern coastal salt marsh	0.72	0.15	0.87
Disturbed southern coastal salt marsh	0.10	—	0.10
Total	**86.83 4**	**1.30**	**88.13 4**

Source: Included in Appendix J~~.~~ as Appendix B, Results of the Jurisdictional Wetlands Delineation
Note: All areas are under the jurisdiction of the Corps, Regional Board, and Commission.

AERIAL SOURCE: SANGIS IMAGERY 2014

FIGURE 3.3-7

Pond 15 Restoration Site and Project Features Jurisdictional Delineation

Otay River Estuary Restoration Project EIS

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0 0.5 1 2 3 4 5 6 Kilometers

0 0.5 1 2 3 4 Miles

SAN DIEGO BAY

2014 EELGRASS SURVEY

SOURCE: Merkel & Associates, Inc., Naval Facilities Engineering Command Southwest, Port of San Diego, 2014.

FIGURE 3.3-8

San Diego Bay 2014 Eelgrass Survey

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3.3.1.4.3 Project Features

Implementation of the project features associated with habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would affect approximately ~~3.16~~ 3.04 acres of jurisdictional waters. The jurisdictional features identified on site are listed in Table 3.3-6 and shown in Figures 3.3-6, 3.3-7, 3.3-9 (Project Features Jurisdictional Delineation – Otay River Floodplain Site), and 3.3-10 (Project Features Jurisdictional Delineation – Pond 15 Site).

Table 3.3-6
Project Features Wetland Delineation Existing Acreage Summary

Vegetation Community/ Land Cover Type	Project Features under Corps, Regional Board, and Commission Jurisdiction, Except Where Noted as Commission-Only* (acres)													
	1	*2*	*~~3~~*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackish water	0.13	0.08 ~~0.20~~	—	—	—	—	—	—	0.01	—	—	—	—	—	**~~0.21~~ 0.22**
Open water	—	—	—	—	—	—	—	—	—	0.40	0.79	0.08	0.03	—	**1.30**
Otay River floodplain ~~restoration –~~ Commission only	—	—	—	—	—	0.56	—	~~—~~ 0.03	—	—	—	—	—	—	**~~0.56~~ 0.59**
Freshwater marsh	—	—	—	—	—	—	0.08	—	—	—	—	—	—	—	**0.08**
Mulefat scrub – Commission only	—	—	—			0.06	—	—	—	—	—	—	—	—	**0.06**
Southern coastal salt marsh	0.06	0.47	—	—	—	0.02	0.02	—	0.06	0.19	—	—	—	—	**0.82**
Salt pond levee	—	—	—	—	—	—	—	—	—	0.33	0.19	0.08	0.31		**0.91**
Total**	**0.19**	**0.55 ~~0.57~~**	**—**	**—**	**—**	**0.64 ~~0.65~~**	**0.10**	**~~—~~ 0.03**	**0.07**	**~~0.59~~ 0.92**	**~~0.79~~ 0.98**	**~~0.08~~ 0.16**	**~~0.03~~ 0.34**	**—**	**~~3.04~~ 3.98**

* Commission wetlands define wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology).
** Totals may not sum precisely due to rounding.

Project Features
1 Otay Channel Protection under Bikeway Bridge (temporary and permanent)
2 Otay Channel Protection (permanent)
~~3 Stockpiles (permanent)~~
3 Note: The material that was to be stockpiled will be used to cover a 23.11-acre area of disturbed habitat east of Nestor Creek; see Project Feature 14
4 Staging Area (temporary)
5 Crossing at Nestor Creek (temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (temporary)
7 Crossing at Otay River (temporary)
8 Bike Path Reroute (temporary)
9 Crossing at Palomar Channel (temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (temporary)
11 Levee Modification of Ponds 13 and 14 – North (temporary and permanent)
12 Levee Modification of Ponds 13 and 14 – South (temporary and permanent)
13 Raised Levee between Ponds 22 and 23 (permanent)
14 ~~Revegetation Area East of Nestor Creek~~Exposure Reduction Cover (permanent)

3.3.2 Wildlife and Fisheries

3.3.2.1 Otay River Floodplain Site

The Otay River Floodplain Site offers moderate habitat value for wildlife, primarily for migratory birds and common upland species, but it also provides foraging habitat for raptor species. The habitat supports a number of upland species prevalent in disturbed and urbanized areas. Habitat on the project site lacks cover and structural diversity and is dominated by non-native species on the eastern side, providing relatively few resources for wildlife. A total of 83 species of wildlife (79 birds and 4 mammals) were observed on the project site (Appendix J). Species commonly observed on site included house finch (*Carpodacus mexicanus*) and lesser goldfinch (*Spinus psaltria*). Several swallow species (family Hirundinidae) were observed during the surveys, and many individuals were observed foraging over the site. A number of raptor species were observed foraging on small mammals in the vegetation. Coastal shorebirds and gulls were periodically observed flying over the site.

No reptile or amphibian species were observed on site. Some species that are likely to occur include western fence lizard (*Sceloporus occidentalis*), common side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Common species of mammals observed in upland parts of the site included brush rabbit (*Sylvilagus bachmani*), coyote (*Canis latrans*), and California ground squirrel (*Spermophilus (Otospermophilus) beecheyi*). Other mammals adapted to living in areas near human disturbance, such as striped skunk (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginiana*), may also occur on the site. Special-status wildlife species observed in the Otay River Floodplain Site are discussed in Section 3.3.3.

3.3.2.2 Pond 15 Site

The Pond 15 Site offers moderate habitat value for wildlife species, primarily for migratory birds and waterbirds, with some support for common upland species that typically inhabit a wide range of sites. Habitat on the project site consists mostly of saline brines, with a narrow upland perimeter formed by the levee system. The pond environment provides habitat for a variety of bird species, with the open water in the ponds supporting bird rafting and loafing and various levees surrounding the ponds providing nesting habitat for seabirds, shorebirds, and waterfowl. Although no fish or marine invertebrates are present in the Pond 15 due to the high salinities, this pond does support brine invertebrates, including brine shrimp and brine flies, which provide foraging opportunities for various avian species. In addition, some areas along the levee slopes provide appropriate vegetation to support Belding's Savannah sparrows. Immediately to the east of Pond 15 is a tidally-influenced drainage channel that also supports a variety of avian species.

The Final EIS for the San Diego Bay NWR CCP (USFWS) describes the range of avian species present within the salt ponds, as well as in the Palomar Channel that borders the eastern edge of

Pond 15. The results of a comprehensive evaluation of migratory bird use at the salt works and adjacent tidal habitats conducted between February 1993 and February 1994 found that Pond 15 supported approximately 23,075 birds, as compared to 48,025 in Pond 23 and approximately 19,250 in Pond 27 (Stadtlander and Konecny 1994). At that time, Pond 15 attracted large numbers of foraging phalaropes, as well as roosting gulls, terns, double-crested cormorant (*Phalacrocorax auritus*)~~cormorants~~, bufflehead (*Bucephala albeola*), American wigeon (*Anas americana*), and ruddy duck (*Oxyura jamaicensis*).

The results of monthly surveys conducted in 2012-2013 indicated that Pond 15 continues to support similar species, as well as high numbers of eared grebes (*Podiceps nigricollis*). Of the 20,458 eared grebes observed in the salt works during the survey, 4,965 were observed in Pond 15 (San Diego Natural History Museum & Avian Research Associates 2014). Survey results also indicated that all 1,592 red phalaropes (*Phalaropus fulicarius*) observed in the salt works where present in Pond 15, while none of the red-necked phalaropes (*Phalaropus lobatus*), 7,580 individuals, were observed in Pond 15. Of the Wilson's phalaropes (*Phalaropus tricolor*) observed in the salt works (a total of 1,127 individuals), 130 were seen in Pond 15. Additional results of the survey conducted in 2012-2013 are present in Table 3.3-7.

The avian use of the western salt ponds and the rest of south bay is but one ecological functionality. *The South San Diego Bay Coastal Wetland Restoration and Enhancement Project Year 4 (2015) Post-construction Monitoring Report* (Southwest Wetlands Interpretive Association 2016), which is the most recent monitoring report that is available, provides a summary of the physical and biological processes recorded for the restoration of the western salt ponds. The tidal amplitude of the western salt ponds now matches that in south San Diego Bay. Natural recruitment and growth of salt marsh vegetation is taking place with expansion of cordgrass and pickleweed species. The fish species assemblage shows the trending toward similarity with south San Diego Bay. The microbenthic invertebrate assemblages are developing and now provide food for migratory shorebirds and fish.

During a visit to the site on September 16, 2015, it was noted that although the number of birds on the Pond 15 Site was high, the species richness was low. In comparison, immediately adjacent to the Pond 15 Site in the San Diego Bay, species richness was very high, as species respond to the tidal influence cycles and the foraging opportunities in the periodically exposed mudflat. The results of surveys conducted between 2009 and 2010 in San Diego Bay indicated that species richness was slightly higher in Pond 15 (55 -77 unique species) than on the adjacent mudflats (41- 55 unique species) (Navy and SDUPD 2011). With respect to bird abundance, the 2009 to 2010 San Diego Bay surveys identified 21-50 birds per month per hectare in Pond 15 and 51-100 birds per month per hectare on the adjacent mudflats (Navy and SDUPD 2011).

Table 3.3-7
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

~~Species~~Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
American Avocet	*Recurvirostra americana*	1274	18	153
American Coot	*Fulican americana*	1		6
American White Pelican	*Pelecanus erythrorhynchos*	90	12	25
American Wigeon	*Anas americana*	195	15	775
Black Skimmer	*Rynchops niger*	2186		18
Black Turnstone	*Arenaria melanocephala*	71	9	6
Black-bellied Plover	*Pluvialis squatarola*	6436	21	1242
Black-crowned Night-Heron	*Nycticorax nycticorax*	2		
Black-necked Stilt	*Himantopus mexicanus*	3094	256	153
Blue-winged Teal	*Anas discors*	0		3
Bonaparte's Gull	*Chroicocephalus philadelphia*	29	2	7
Brant	*Branta bernicla*	0		909
Brown Pelican	*Pelecanus occidentalis*	479	13	39
Bufflehead	*Bucephala albeola*	771	17	85
California Gull	*Larus californicus*	3700	344	44
Canada Goose	*Branta canadensis*	12		
Caspian Tern	*Hydroprogne caspia*	1365	355	52
Cinnamon Teal	*Anas cyanoptera*	4		
Clark's Grebe	*Aechmophorus clarkii*	0		7
Common Goldeneye	*Bucephala clangula*	52		
Common Tern	*Sterna hirundo*	3		1
Double-crested Cormorant	*Phalacrocorax auritus*	940	444	72
Dowitcher sp.	*Limnodromus* sp.	758	1	1357
Duck sp.		12		
Dunlin	*Calidris alpina*	3376		1429
Eared Grebe	*Podiceps nigricollis*	20458	4965	36
Elegant Tern	*Thalasseus elegans*	6959	314	394
Eurasian Wigeon	*Anas penelope*	0		3
Forster's Tern	*Sterna forsteri*	204	3	62
Gadwall	*Anas strepera*	33	12	21
Great Blue heron	*Ardea herodias*	7		14
Great Egret	*Ardea alba*	8	2	30
Greater Scaup	*Aythya marila*	0		5
Greater Yellowlegs	*Tringa melanoleuca*	142	13	109
Green-winged Teal	*Anas crecca*	0		115
Gull sp.		135	2	

Table 3.3-7
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

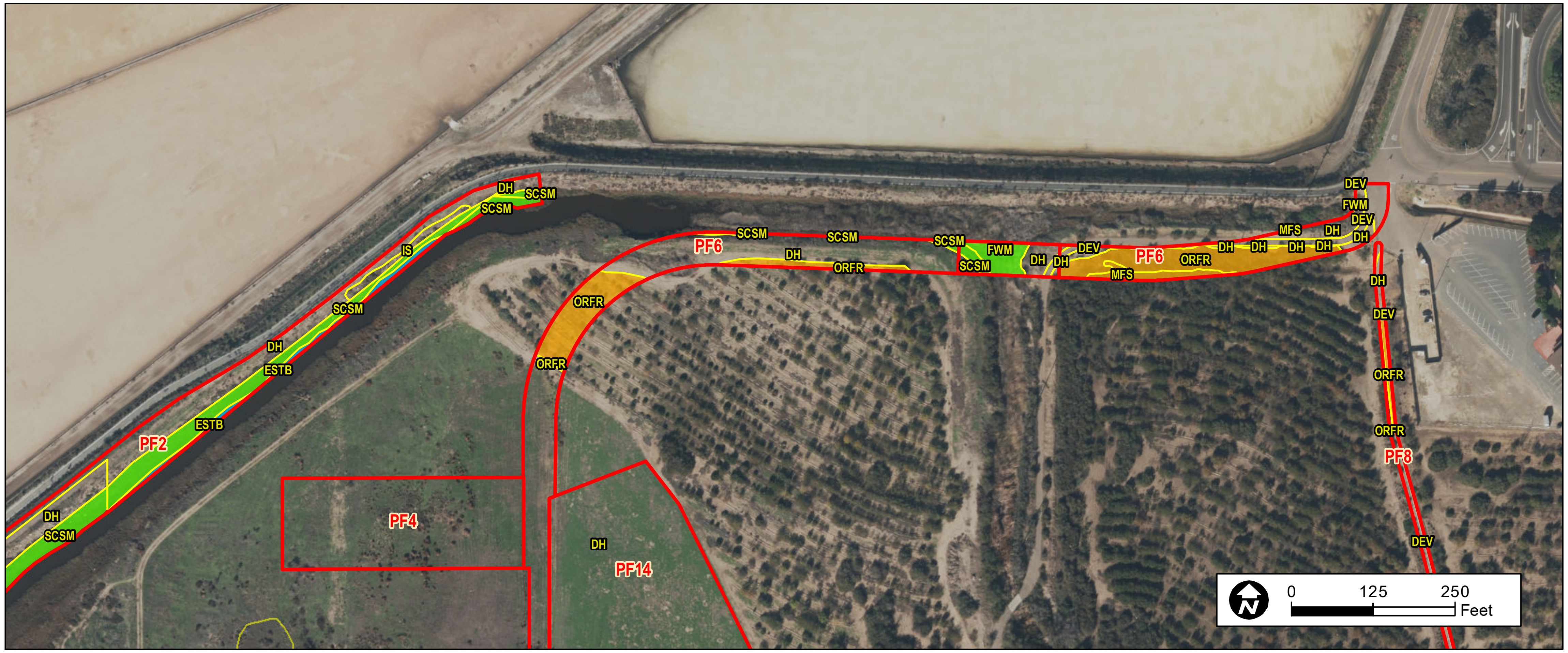
~~Species~~Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
Gull-billed Tern	*Gelochelidon nilotica*	165		99
Heermann's Gull	*Larus heermanni*	2	2	
Herring Gull	*Larus argentatus*	119	44	29
Horned Grebe	*Podiceps auritus*	9		9
Killdeer	*Charadrius vociferus*	1034	3	71
Lapland Longspur	*Calcarius lapponicus*	3		
Large-billed Savannah Sparrow	*Passerculus sandwichensis rostratus*	3	1	5
Least Sandpiper	*Calidris minutilla*	3120	236	2476
California Least Tern	*Sterna antillarum browni*	70	1	49
Lesser Scaup	*Aythya affinis*	323	65	144
Lesser Yellowlegs	*Tringa flavipes*	4	2	
Long-billed Curlew	*Numenius americanus*	21	8	101
Long-billed Dowitcher	*Limnodromus scolopaceus*	3		361
Long-tailed Duck	*Clangula hyemalis*	3		
Mallard	*Anas platyrhynchos*	31	8	9
Marbled Godwit	*Limosa fedoa*	1329	159	692
Marsh Wren	*Cistothorus palustris*	2		10
Northern Pintail	*Anas acuta*	33	5	252
Northern Shoveler	*Anas clypeata*	7490	944	526
Osprey	*Pandion haliaetus*	19	1	12
~~Peep~~Sandpiper sp.		13286	148	70
Phalarope sp.	*Phalaropus* sp.	50		
Red Knot	*Calidris canutus*	1911	2	467
Red Phalarope	*Phalaropus fulicarius*	0	1592	
Red-breasted Merganser	*Mergus serrator*	0		17
Reddish Egret	*Egretta rufescens*	1		14
Redhead	*Aythya americana*	82		4
Red-necked Phalarope	*Phalaropus lobatus*	7580		25
Ring-billed Gull	*Larus delawarensis*	296	5	71
Royal Tern	*Thalasseus maximus*	1352	71	115
Ruddy Duck	*Oxyura jamaicensis*	1		66
Ruddy Turnstone	*Arenaria interpres*	24		107
Savannah Sparrow, Belding's	*Passerculus sandwichensis beldingi*	644	106	333
Scaup sp.	*Aythya* sp.	140	24	54
Semipalmated Plover	*Charadrius semipalmatus*	940		1358

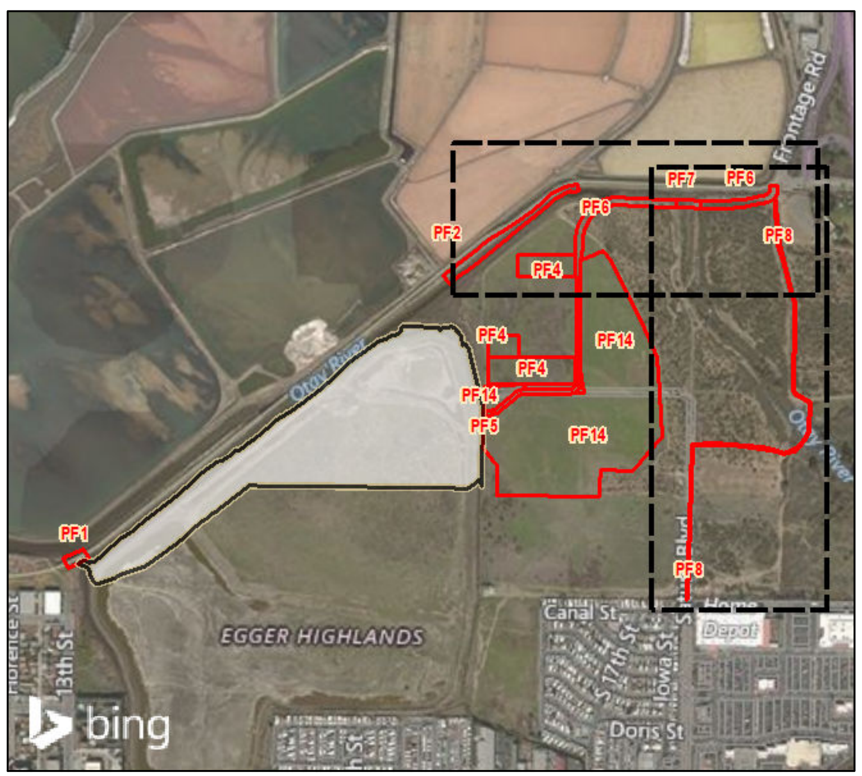
Table 3.3-7
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

~~Species~~Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
Short-billed Dowitcher	*Limnodromus griseus*	11	5	305
Snow Goose	*Chen caerulescens*	3	3	
Snowy Egret	*Egretta thula*	9	2	94
Western Snowy Plover	*Charadrius nivosus nivosus*	141	1	5
Song Sparrow	*Melospiza melodia*	52		
Spotted Sandpiper	*Actitis macularius*	6	3	1
Surf Scoter	*Melanitta perspicillata*	0		13
Western Grebe	*Aechmophorus occidentalis*	1		30
Western Gull	*Larus occidentalis*	986	165	94
Western Sandpiper	*Calidris mauri*	51307	370	48069
Whimbrel	*Numenius phaeopus*	184		12
Willet	*Tringa semipalmata*	6554	415	1831
Wilson's Phalarope	*Phalaropus tricolor*	1127	130	

Source: San Diego Natural History Museum & Avian Research Associates 2014

~~Habitat on the project site consists mostly of saline brines, with a narrow upland perimeter formed by the levee system. The pond environment provides habitat for a variety of bird species. The open water in the ponds supports bird rafting and loafing; the brine flies and brine shrimp that can be abundant in the ponds provide foraging opportunities; and various levees surrounding the ponds provide nesting habitat for seabirds, shorebirds, and waterfowl.~~





Otay River Floodplain Restoration Site	
Project Feature (PF)	

Waters of the U.S.

- Wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Section 10 Tidal
- Non-wetlands, CCC only

Vegetation Communities and Land Covers

- ESTB, Brackishwater
- FWM, Coastal and Valley Freshwater Marsh
- MFS, Mule Fat Scrub
- SCSM, Southern Coastal Salt Marsh
- SPBB, Former Salt Pond Bottom and Borrow Area
- IS, Isocoma Scrub
- ORFR, Otay River Floodplain Restoration
- DH, Disturbed Habitat
- DEV, Developed Land

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-9

Project Features Jurisdictional Delineation

Otay River Estuary Restoration Project EIS

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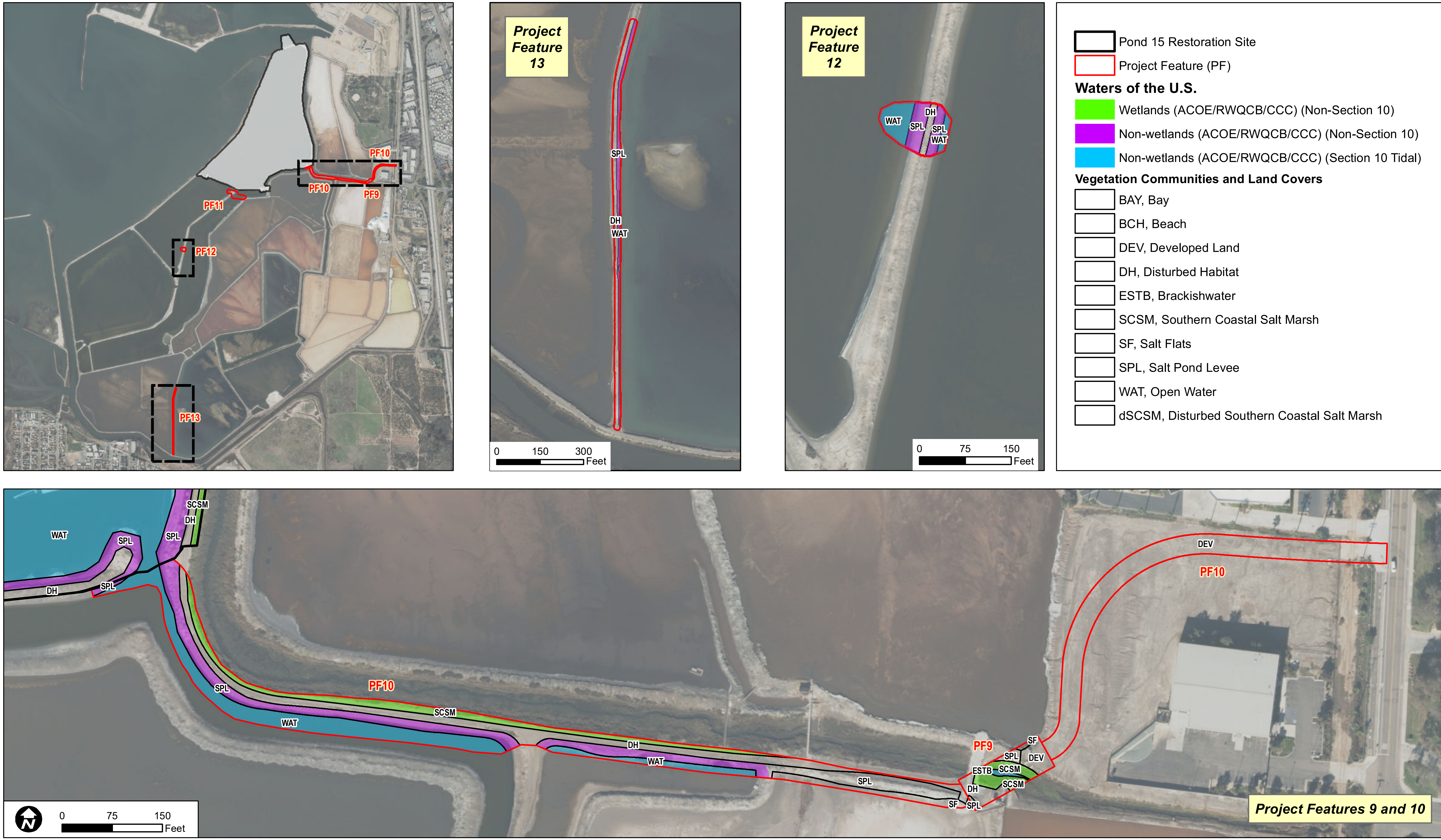

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-10

Project Features Jurisdictional

Otay River Estuary Restoration Project EIS

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Within the shorebird group, per surveys conducted between 1999 and ~~the present~~2011 (SDNHM and ARA 2011), the most common species ~~include~~within the salt pond complex included red-necked phalarope~~ (*Phalaropus lobatus*)~~, Wilson's phalarope~~ (*P. tricolor*)~~, western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), willet (*Tringa semipalmata*), American avocet (*Recurvirostra americana*), and black-necked stilt (*Himantopus mexicanus*). Eared grebe ~~(*Podiceps nigricollis*)~~ represents the largest population of any species occurring at the Pond 15 Site. These species, as well as California brown pelican (*Pelecanus occidentalis californicus*), California gull (*Larus californicus*), double-crested cormorant~~ (*Phalacrocorax auritus*)~~, and elegant tern (*Thalasseus elegans*), are also abundant throughout the ~~salt pond complex.~~ South Bay Salt Works.

Many of the levees within the salt pond complex, including those around Pond 15 provide nesting habitat for a diverse ~~and abundant~~ array of colonial nesting seabirds~~, including the Federally~~ and some shorebirds. Seabirds that nest on the salt pond levees include the federally endangered California least tern, Caspian tern (*Hydroprogne caspia*), elegant tern, royal tern (*Thalasseus maximus*), western gull-billed tern (*Gelochelidon nilotica vanrossemi*), Forster's tern (*Sterna forsteri*), and black skimmer (*Rynchops niger*). Western snowy plovers, American avocets, and black-necked stilts also nest on or along the levees. California least terns, western snowy plovers, gull-billed terns, Caspian terns, Forster's terns, black skimmers, black-necked stilts, and double-crested cormorants have been documented nesting within or in proximity to the Pond 15 Site in various years between 1999 and the present~~ (SDNHM and ARA 2011)~~. The locations of these nesting areas within the salt works between 2006 and 2017 are presented in Table 3.3-8 and Figure 3.3-11.

Table 3.3-8
Locations[1] of Waterbird Nest Sites at the Salt Works Between 2006 – 2011[2]

	2006	2007	2008	2009	2010	2011
Nesting Seabirds Common Name (Scientific Name)						
California least tern *(Sterna antillarum browni)*	dikes VI, VII, IX, X, XII, spits 4, 6	dikes IV, VI, VII, IX, X, XII, spits 4, 6, berm A	dikes IV, VII, IX, X, XI, XII, spits 4, 6, berms A, E	dikes IV,VII, IX, X, XI, XII, XV, spits 4, 6, berm A, E, H	dikes III, IV, VII, IX, X, XII, XV, XVI, spits 4,6, berm A, E, H	dikes IV, VII, IX, X, XII, spits 4,6, berm E, E levee of Pond 11
Gull-billed tern *(Gelochelidon nilotica vanrossemi)*	dikes II, III, V	dikes II, III, V	dikes III, IV, V, XIII, berm C	dikes III, V, VI, XIII, spits 9, 10	dikes I, II, III, V	dikes II, III, IV, V, VI
Caspian tern *(Hydroprogne caspia)*	dikes I, II, III, VIII, perimeter road pond 14	dikes I, II, III, VIII	dikes I, II, III, V, VIII, spit 5, perimeter road pond 14	dike II, III, V, VIII, spit 5	dikes II, V, VIII	dikes II, V

Table 3.3-8
Locations[1] of Waterbird Nest Sites at the Salt Works Between 2006 – 2011[2]

	2006	2007	2008	2009	2010	2011
Royal tern *(Thalasseus maxiumus)*	dikes I, II	dikes II, III	dikes I, II, III, VIII, perimeter road pond 14	dikes II,V, VIII	dikes II, III, V, VIII, berm F	dikes II, V, VIII
Elegant tern *(Thalasseus elegans)*	dikes I, II	dikes I, II, III, VI	dikes I, II, III, VIII, perimeter road pond 14	dikes I,II, III, V, VIII, spit 5, berm F	dikes II, III, IV, V, VIII, berm F	dike I, II, III, V, spit 1, berm F
Forster's tern *(Sterna forsteri)*	dikes I, II, III, V, VI, VII, spits 1,9, 10 perimeter road ponds 12,14,15	dikes III, V, VI, VII, spit 1, perimeter road ponds 12, 15	dike II, III, V, VI, VII, spits 1, 9, perimeter road ponds 12, 15	dikes II, III, V, VI, VII, spit 1, perimeter road ponds 12, 15	dikes I, II, III, V, VII, spit 1, perimeter road ponds 12, 15	dikes II, III, V, VI, VII, spit 1, perimeter road pond 12
Black skimmer *(Rynchops niger)*	dikes I, II, III, V, VI, VII, XIII, spit 8	dikes I, II, III, IV, V, VI, VII, spits 9, 10, perimeter road pond 12	dike II, III, IV, V, VI, VII, XIII	dikes III, IV, VI, VII, XIII, spit 4	dikes I, III, IV, V, VI, VII, XIII, spit 1, perimeter road ponds 12, 15	dikes II, III, IV, V, VI, VII, spit 1, perimeter road pond 12
Other Nesting Waterbirds Common Name/Scientific Name						
Western Snowy Plover *(Charadrius nivosus nivosus)*	dike IV	dike IV	dike IV	dikes IV, IX, spit 6, berm E, perimeter road pond 22	dikes IV, VIII, berm D	dikes IV, X, XII, spit 2, berm A, Pond 42, E levee of Pond 11
Double-crested cormorant *(Phalacrocorax auritus)*	dike II, barge	dikes II, III, VIII, barge	dike III, barge	dike II, barge	dike II, III, barge	dike II, barge

1 These locations are illustrated in Figure 3.3-11.
2 Results of annual surveys conducted at the salt works by Robert Patton for the USFWS.

Locations[1] of Waterbird Nest Sites at the Salt Works Between 2012 – 2017[2]

	2012	2013	2014	2015	2016	2017
Nesting Seabirds						
California least tern *(Sterna antillarum browni)*	dikes IV, VII, IX, X, XII, spit 6, berm A, E levee of Pond 11	dikes III, IV, VII, IX, X, XII, spits 4, 6, berms A, E, E levee of Pond 11	dikes IV, VII, IX, X, spit 6, berm A, E levee of Pond 11	dikes IV, VII, IX, X, berm A, levee of Pond 11	dikes IV, VII, IX, X, spit 6, berms A, H, levee of Pond 11	dikes IV, VI, VII, IX, X, XII, spit 6, berm A

Locations[1] of Waterbird Nest Sites at the Salt Works Between 2012 – 2017[2]

	2012	2013	2014	2015	2016	2017
Gull-billed tern *(Gelochelidon nilotica vanrossemi)*	dikes II, III, V, VI, spit 3	dikes II, V	dikes II, IV, spit 3	dikes I, II, III, V	dikes I, II, V	dikes II, III, V
Caspian tern *(Hydroprogne caspia)*	dikes I, II, V, VIII	dikes II, V, VIII	dikes II, III, V, VIII	dikes II, III, V, VIII	dikes II, VIII, spit 8	dike II, VIII, perimeter road pond 14
Royal tern *(Thalasseus maxiumus)*	dikes I, II, V, VIII	dikes II, V	dikes II, III, V, VI	dikes II, V, VIII	dikes II, III, V, VIII, spit 5, berm F	dikes I, II, III, IV, V,XIII, perimeter road pond 14
Elegant tern *(Thalasseus elegans)*	dikes II, III, V, VIII	dikes II, V	dikes I, II, III, V, VI, VIII, spit 1	dikes II, III,IV, VI, VIII	dikes I, II, III, V, VI, VIII, XIII, spits 1, 5, 9, 10, berm F	dikes II, IV, V, VIII, XIII, berm F, perimeter road ponds 14, 15
Forster's tern *(Sterna forsteri)*	dikes II, III, V, VII, spit 1, perimeter road pond 12	spit 1, perimeter road pond 15	spit 1, perimeter road pond 12	dike VI, VII, spit 1, perimeter road ponds 12, 15	dike VII, spit 1, perimeter road pond 12, nw corner of Pond 23	dike VII, spit 1, perimeter road pond 12
Black skimmer *(Rynchops niger)*	dikes II, III, V, VI, VII, spits 1,4	dikes I, II, IV, V, VII, perimeter road pond 15	dikes II, III,IV, V, VI, VII, spits 1, 9, 10	dikes II, III, IV, V, VI, spits 1, 9, perimeter road pond 15	dikes I, II, III, V, VI, VII, spit 1	dikes II, III, IV, V, VI, VII
Other Nesting Waterbirds						
Western Snowy Plover *(Charadrius nivosus nivosus)*	dikes IV, IX, X, XII, spit 2, berm A, E levee of Pond 11, Ponds 30, 40, 41	dikes IV, IX, X, XII, spit 2, 4, 6, berm A, F, E levee of Pond 11, Pond 40	dikes IV, VII, IX, X, XI, XII, XIV, spits 2, 4, 6, berms A, C, F, H, ponds 29, 30, 45, 52, Pond 20	dikes I, III,IV, VI, VII, IX, X, XI, XII, XV, XVI, spits 2, 4, 6, berms A, C, E, H, ponds 29, 40, 42, 46	dikes III, IV, VI, VII, X, XII, XV, spits 2, 4, 6, 9, berms C, D, E, berm between ponds 28 & 25, ponds 28, 29, 30, 43, 44, Pond 20	dikes III, IV, VI, VII, IX, X, XI, XII, XIV, XV, XVI, spits 2, 3, 4, 6, berms C, D, E, F, ponds 28, 29, 42, 43, 46, Pond 20
Double-crested cormorant *(Phalacrocorax auritus)*	dike II, barge	barge	dikes II, VIII, barge	dike V, barge	dikes III, V,	dike II, V, VIII, barge

1 These locations are illustrated in Figure 3.3-11.
2 Results of annual surveys conducted at the salt works by Robert Patton for the USFWS.

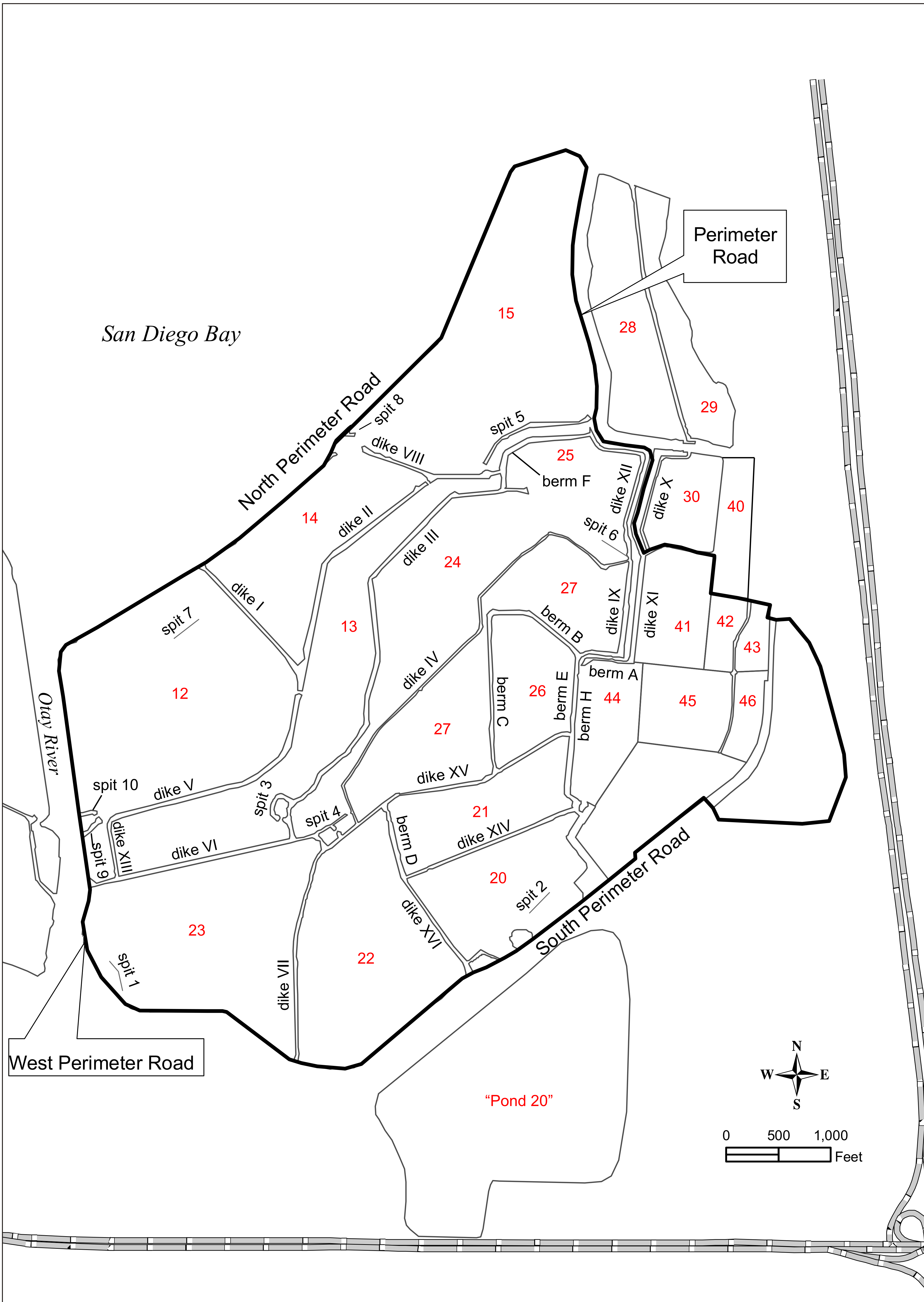
3.3.3 Endangered and Threatened Species and Other Species of Concern

Special-status species are those species that have been afforded special recognition by Federal, State, or local resource agencies or organizations and are of relatively limited distribution; they typically require unique habitat conditions. Special-status species are defined as meeting one or more of the following criteria: listed as threatened or endangered or candidates for future listing as threatened or endangered under the Federal Endangered Species Act or California Endangered Species Act; listed as species of concern by CDFW; bird species identified by the Service as Birds of Conservation Concern (USFWS 2008); plant species considered by the California Native Plant Society to be "rare, threatened, or endangered in California" (California Rare Plant Rank 1A, 1B, and 2, as well as California Rare Plant Rank 3 and 4[1]); a plant listed as rare under the California Native Plant Protection Act;[2] or a plant considered locally significant (a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region, or is so designated in local or regional plans, policies, or ordinances, including Multiple Species Conservation Programs (MSCPs)).

Special-status plant species that were observed or have potential to occur on site are presented in Table 3.3-~~7~~9. Special-status plants with low or no potential to occur, based on the location and conditions, are shown in Table 3.3-~~8~~10. Results of surveys are provided in Section 3.3.3.1 and are shown on Figure 3.3-1~~1~~2, Otay River Floodplain Restoration Site Special-Status Plant Species, Figure 3.3-1~~2~~3, Pond 15 Restoration Site Special-Status Plant Species, and Figure 3.3-1~~3~~4, Ponds 22 and 23 Special-Status Plant Species.

1 California Rare Plant Ranks 3 and 4 are included in the California Natural Diversity Database (CNDDB) *Special Vascular Plants, Bryophytes, and Lichens List* (refer to the current online published list available at http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp) (CDFW 2014a).

2 As defined by the California Native Plant Protection Act, a plant is rare when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (California Fish and Game Code, Section 1901) (CDFW 2014a).



SOURCE: USFWS,2017.

FIGURE 3.3-11

Nesting Locations as Described in Table 3.3-8

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Table 3.3-~~7~~9
Special-Status Plant Species Detected or Potentially Occurring on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Corethrogyne filaginifolia var. *incana*	San Diego sand aster	None/ None/ None	1B.1	Chaparral, coastal bluff scrub, coastal scrub/perennial herb/ June–September/10–380	Moderate potential to occur but not detected. Although the plant may not have been flowering during the May focused survey, the vegetative form of the species would have been observed and none were detected. There is suitable habitat, and the project site is located within the elevation range for this species.
Lycium californicum	California box-thorn	None/ None/ None	4.2	Costal bluff scrub, coastal scrub/perennial shrub/ December–August/15–590	Observed on the Otay River Floodplain Site during focused plant survey.
Suaeda esteroa	Estuary seablite	None/ None/ None	1B.2	Coastal salt marshes and swamps/perennial herb/May–October (Jan)/<20	Observed during focused plant surveys at Otay River Floodplain Site and Pond 15 Site.
Suaeda taxifolia	Woolly seablite	None/ None/ None	4.2	Coastal bluff scrub, coastal dunes, marshes and swamps (margins of coastal salt)/ perennial evergreen shrub/ January–December/0–165	Observed during focused plant survey on Otay River Floodplain Site.

NCCP = Natural Communities Conservation Plan; ft amsl = feet above mean sea level.
CRPR: California Rare Plant Rank
1B: Plants rare, threatened, or endangered in California and elsewhere
4: Plants of limited distribution – a watch list
Threat Rank
.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 – Fairly threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Abronia maritima	Red sand-verbena	None/ None/ None	4.2	Coastal dunes/perennial herb/ February–November/ 10–330	No potential to occur. Although the project site is located within the elevation range for this species, there is no suitable habitat on site.
Acanthomintha ilicifolia	San Diego thorn-mint	FT/SE/ MSCP NE	1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay/annual herb/ April–June/30–3,150	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Agave shawii var. *shawii*	Shaw's agave	None/ None/ MSCP	2B.1	Coastal bluff scrub, coastal scrub/leaf succulent/ September–May/30–250	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Ambrosia pumila	San Diego ambrosia	FE/ None/ MSCP NE	1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; often disturbed, sometimes alkaline/ rhizomatous herb/ May–October/60–1,360	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Aphanisma blitoides	Aphanisma	None/ None/ None	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy/ annual herb/March–June/ <1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Arctostaphylos glandulosa ssp. *crassifolia*	Del Mar manzanita	FE/ None/ MSCP	1B.1	Maritime chaparral; sandy/ evergreen shrub/December–June/<1,200	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Artemisia palmeri	San Diego sagewort	None/ None/ None	4.2	Chaparral, coastal scrub, riparian forest, scrub, and woodland; sandy, mesic/ deciduous shrub/May–September/50–3,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Astragalus tener var. *titi*	Coastal dunes milk-vetch	FE/SE/ MSCP	1B.1	Coastal bluff scrub, coastal dunes, coastal prairie; mesic, often vernally mesic/annual herb/March–May/<170	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Atriplex coulteri	Coulter's saltbush	None/ None/ None	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland; alkaline or clay/perennial herb/March–October/10–1,500	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Atriplex pacifica	South Coast saltscale	None/ None/ None	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, playas/ annual herb/March–October/ <500	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Atriplex parishii	Parish's brittlescale	None/ None/ None	1B.1	Chenopod scrub, playas, vernal pools/annual herb/ June–October/80–6,300	Low potential to occur. There is suitable habitat within the playa on site and the project site is located within the elevation range for this species. However, the species tends to be associated with a claypan soil and vernal pools, which are not present.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	None/ None/ None	1B.2	Coastal bluff scrub, coastal scrub; alkaline/annual herb/ April–October/30–650	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Bergerocactus emoryi	Golden-spined cereus	None/ None/ None	2B.2	Closed-cone conifer forest, chaparral, coastal scrub; sandy/shrub/May–June/ 10–1,300	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Calandrinia breweri	Brewer's calandrinia	None/ None/ None	4.2	Chaparral, coastal scrub; sandy or loamy, disturbed sites and burns/annual herb/March–June/30–4,000	Absent. There is suitable habitat on site and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
California (=Erodium) macrophylla	Round-leaved filaree	None/ None/ None	1B.1	Cismontane woodland, valley and foothill grassland; clay/ annual herb/March–May/50–4,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species, but this species would have been observed during the focused plant survey.
Camissoniopsis lewisii	Lewis's evening primrose	None/ None/ None	3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy or clay/annual herb/March–May (June)/<1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Ceanothus verrucosus	Wart-stemmed ceanothus	None/ None/ MSCP	2B.2	Chaparral/evergreen shrub/ December–May/<1,250	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Centromadia (=Hemizonia) parryi spp. *australis*	Southern tarplant	None/ None/ None	1B.1	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), vernal pools/annual herb/May–November/<400	Low potential to occur. There is suitable habitat on site and the project site is located within the elevation range for this species. However, the site is too disturbed for the species, and the soils required for the species need to have a clay pan.
Centromadia (=Hemizonia) pungens ssp. *laevis*	Smooth tarplant	None/ None/ None	1B.1	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland; alkaline/annual herb/April–September/<1,580	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	None/ None/ None	1B.1	Coastal bluff scrub, coastal dunes/annual herb/January–August/10–330	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Chorizanthe orcuttiana	Orcutt's spineflower	FE/SE	1B.1	Maritime chaparral, closed-cone conifer forest, coastal scrub/annual herb/March–May/<400	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Cistanthe maritima	Seaside cistanthe	None/ None/ None	4.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland/annual herb/ February–August/6–984	Absent. There is suitable habitat and the project site is located within the elevation range for this species, but the species would have been observed during the focused plant survey.
Chloropyron maritimum ssp. *maritimum*	Salt marsh bird's-beak	FE/SE/ MSCP	1B.2	Coastal dunes, coastal saltwater marshes and swamps/annual herb; hemiparisitic/May–October/ <100	Absent. There is suitable habitat and the project site is located within the elevation range for this species, but the species would have been observed during the focused plant survey.
Dicranostegia orcuttiana	Orcutt's bird's-beak	None/ None/ MSCP	2B.1	Coastal scrub/annual herb/ (Mar) April–July (Sept)/ 30–1,150	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Corethrogyne filaginifolia var. *linifolia*	Del Mar Mesa sand aster	None/ None/ None	1B.1	Coastal bluff scrub, maritime chaparral (openings), coastal scrub; sandy/perennial herb/ May–September/10–380	Low potential to occur. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would likely have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Deinandra [=Hemizonia] paniculata	Paniculate tarplant	None/ None/ None	4.2	Coastal scrub, valley and foothill grassland, vernal pools; usually vernally mesic/annual herb/April–November/80–3,100	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Dudleya blochmaniae spp. *blochmaniae*	Blochman's dudleya	None/ None/ None	1B.1	Chaparral, coastal bluff scrub, coastal scrub, valley and foothill grassland, rocky; often clay or serpentinite/perennial herb/April–June/15–1,500	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Dudleya variegata	Variegated dudleya	None/ None/ MSCP NE	1B.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/perennial herb/ April–June/<1,900	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Dudleya viscida	Sticky dudleya	None/ None/ MSCP	1B.2	Coastal bluff scrub, chaparral, coastal scrub; gabbroic soils/ rocky/perennial herb/May–June/30–1,800	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	None/ None/ None/ None	1B.1	Vernal pools/annual-perennial herb/July/10–150	Absent. Although the project site is located within the elevation range for this species, there are no vernal pools on site.
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE/SE/ MSCP NE	1B.1	Coastal scrub, valley and foothill grassland, vernal pools, mesic/annual-perennial herb/ April–June/60–2,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Eryngium pendletonense	Pendleton button-celery	None/ None/ None	1B.1	Coastal bluff scrub, valley and foothill grassland, vernal pools; clay, vernally mesic/perennial herb/April–June/50–360	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Erysimum ammophilum	Sand-loving wallflower	None/ None/ MSCP	1B.2	Maritime chaparral, coastal dunes, coastal scrub; sandy, openings/perennial herb/ February–June/<200	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Euphorbia misera	Cliff spurge	None/ None/ None	2B.2	Coastal bluff scrub, coastal scrub, Mojavean desert scrub; rocky/shrub/December–August/ 30–1,650	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Ferocactus viridescens	San Diego barrel cactus	None/ None/ MSCP	2B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools/perennial stem succulent/ May–June/<1,500	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Geothallus tuberosus	Campbell's liverwort	None/ None/ None	1B.1	Coastal scrub (mesic), vernal pools; soil/ephemeral liverwort/ NA/30–2,000	Low potential to occur. There is marginal habitat and the project site is located within the elevation range for this species. However, this species is only known from four locations.
Harpagonella palmeri	Palmer's grapplinghook	None/ None/ None	4.2	Chaparral, coastal scrub, valley and foothill grassland; clay/ annual herb/March–May/ 60–3,100	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Heterotheca sessiliflora ssp. *sessiliflora*	Beach goldenaster	None/ None/ None/	1B.1	Coastal dunes, coastal scrub, coastal chaparral/annual herb/ July–November/<35	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Isocoma menziesii var. *decumbens*	Decumbent goldenbush	None/ None/ None	1B.2	Chaparral, coastal scrub (sandy, often disturbed areas)/ shrub/April–November/ 30–450	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected
or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Iva hayesiana	San Diego marsh-elder	None/ None/ None	2B.2	Marshes and swamps, playas/ perennial herb/April–November/30–1,650	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Juncus acutus spp. *leopoldii*	Southwestern spiny rush	None/ None/ None	4.2	Coastal dunes (mesic), meadows and alkaline seeps, coastal saltwater marshes and swamps/rhizomatous herb/ May–June/<3,000	Absent within the project site; however, the species was observed during the focused plant survey just off site to the northeast of the Otay River Floodplain Site.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/ None/ None	1B.1	Saltwater marsh and swamps, playas, vernal pools/annual herb/February–June/<4,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	None/ None/ None	4.3	Chaparral, coastal scrub/ annual herb/January–July/ <2,900	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Leptosyne maritima	Sea dahlia	None/ None/ None	2B.2	Coastal bluff scrub, coastal scrub/perennial herb/March–May/16–492	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Microseris douglasii ssp. *platycarpha*	Small-flowered microseris	None/ None/ None	4.2	Cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/ annual herb/March–May/ 50–3,500	Absent. There are no suitable clay soils within the project area and this species would have been observed during the focused plant survey.
Myosurus minimus ssp. *apus*	Little mousetail	None/ None/ None	3.1	Vernal pools, valley and foothill grassland; alkaline/annual herb/March–June/60–2,100	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

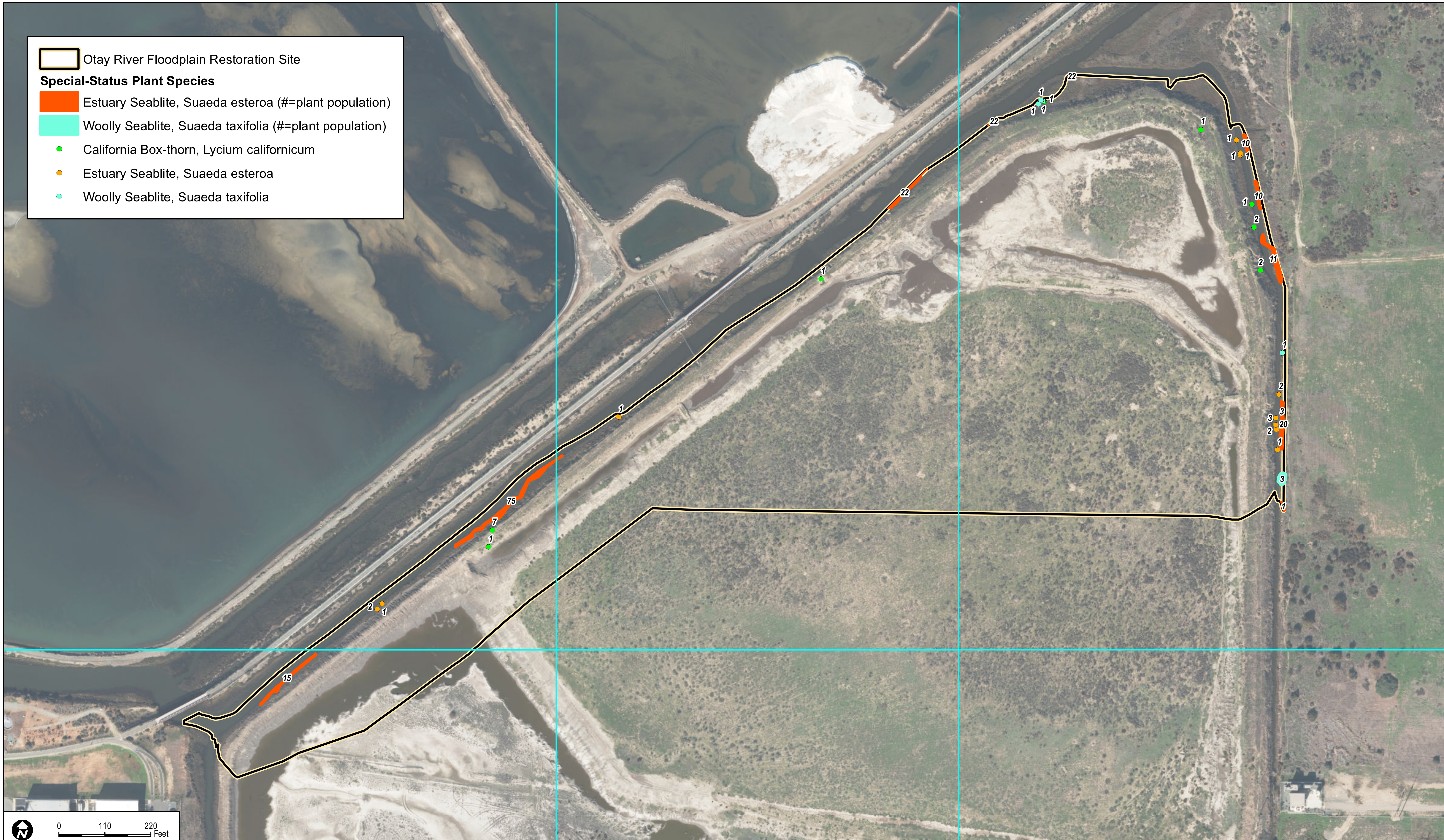
Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Nama stenocarpum	Mud nama	None/ None/ None	2B.2	Marshes and swamps, lake margins, riverbanks/annual-perennial herb/ January–July/ 15–1,650	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Nemacaulis denudata var. *denudata*	Coast woolly-heads	None/ None/ None	1B.2	Coastal dunes/annual herb/ April–September/<330	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Orcuttia californica	California Orcutt grass	FE/SE/ MSCP NE	1B.1	Vernal pools/annual herb/ April–August/50–2,200	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Orobanche parishii ssp. *brachyloba*	Short-lobed broom-rape	None/ None/ None	4.2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy/ perennial herb parasitic/ April – October/<1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Phacelia ramosissima var. *austrolitoralis*	South coast branching phacelia	None/ None/ None	3.2	Chaparral, coastal dunes, coastal scrub, coastal salt marshes and swamps; sandy, sometimes rocky/perennial herb/March–August/20–1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Phacelia stellaris	Brand's star phacelia	FC/ None	1B.1	Coastal dunes, coastal scrub/ annual herb/March–June/ <1,300	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

Table 3.3-~~8~~10
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Piperia cooperi	Chaparral rein orchid	None/ None/ None	4.2	Chaparral, cismontane woodland, valley and foothill grassland/perennial herb/ March–June/50–5,200	Absent. No suitable habitat exists on site and this species would have been observed during the focused plant survey.
Psilocarphus brevissimus var. *multiflorus*	Delta woolly-marbles	None/ None/ None	4.2	Vernal pools/annual herb/ May–June/30–1,650	Absent. Although the project site is located within the elevation range for this species, there are no vernal pools on site.
Quercus dumosa	Nuttall's scrub oak	None/ None/ None	1B.1	Chaparral, coastal scrub, closed-cone coniferous forest; sandy, clay loam/evergreen shrub/February–April/50–1,300	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Senecio aphanactis	Chaparral ragwort	None/ None/ None	2B.2	Chaparral, cismontane woodland, coastal scrub; sometimes alkaline/annual herb/January–April/50–2,630	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Triquetrella californica	Coastal triquetrella	None/ None/ None	1B.2	Coastal bluff scrub, coastal scrub; soil/moss/NA/30–330	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

NCCP = Natural Communities Conservation Plan; ft amsl = feet above mean sea level; NA = not applicable
FC: Federal candidate
FE: Federally listed as endangered
FT: Federally listed as threatened
SE: State-listed as endangered
MSCP Covered species
MSCP NE Narrow endemic species
CRPR: California Rare Plant Rank
1B: Plants rare, threatened, or endangered in California and elsewhere
2B: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants about which we need more information – a review list
4: Plants of limited distribution – a watch list
Threat Rank
.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 – Fairly threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)
.3 – Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)



AERIAL SOURCE: SANDAG IMAGERY 2014

Figure 3.3-12

Otay River Floodplain Restoration Site Special-Status Plant Species

Otay River Estuary Restoration Project EIS

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AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-13

Pond 15 Restoration Site Special-Status Plant Species

Otay River Estuary Restoration Project EIS

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AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-14

Ponds 22 and 23 Site Special-Status Plant Species

Otay River Estuary Restoration Project EIS

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Special-status wildlife species that were observed or have potential to occur on site are presented in Table 3.3-~~9~~11 and Table 3.3-1~~1~~3. Special-status wildlife species with low or no potential to occur, based on the location and conditions, are provided in Table 3.3-1~~0~~2 and Table 3.3-1~~2~~4. Separate analysis was conducted for the Otay River Floodplain Site and the Pond 15 Site due to the different habitats present and the different survey methods and results available. Focused surveys based on the most recent protocols were conducted within the Otay River Floodplain Site for a number of special-status species, and the results are provided in Tables 3.3-~~9~~11 and 3.3-1~~0~~2. Locations of special-status species are shown in Figure 3.3-1~~4~~5, Otay River Floodplain Restoration Site Special-Status Wildlife Species.

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
			Reptiles		
Phrynosoma blainvillii	Coast (San Diego) horned lizard	None/SSC/ MSCP	Coastal sage scrub, annual grassland, chaparral, oak and riparian woodland, coniferous forest.	Moderate potential to occur within the sandy soils and in the *Isocoma* scrub areas.	Appendix J
Aspidoscelis hyperythra	Orange-throated whiptail	None/SSC/ MSCP	Coastal sage scrub, chaparral, grassland, juniper and oak woodland.	Moderate potential to occur within the sandy soils and in the *Isocoma* scrub areas.	Appendix J
Thamnophis hammondii	Two-striped gartersnake	None/SSC/ Not Covered	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools.	Moderate potential. Suitable habitat is present within the freshwater portion of the Otay River channel and Nestor Creek.	Appendix J
			Birds		
Athene cunicularia (burrow sites and some wintering sites)	Burrowing owl	BCC/SSC/ MSCP	Grassland, lowland scrub, agriculture, coastal dunes, and other artificial open areas.	Observed. Has been recorded in the region. Numerous holes for their use and ~~soils are~~ sandy. However, vegetation grows so tall there is little vantage point for them to use. One owl observed once at the beginning of the breeding season about 1,000 feet to the east. It did not stay to breed. Three were observed nearby in ~~off-site surveys conducted in~~a 2011 survey (Southwest Wetlands Interpretive Association data).	Appendix J

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Asio flammeus	Short-eared owl	None/SSC/ Not Covered	Open areas with few trees, such as grasslands, prairies, dunes, meadows, irrigated lands, saline and fresh emergent wetlands. Breeds in coastal areas in Del Norte and Humboldt Counties, San Francisco Bay Delta, northeastern Modoc plateau, east side of Sierra Nevada from Lake Tahoe south to Inyo County, and San Joaquin Valley. Uncommon winter migrant in Southern California, and widespread during winter in Central Valley and coastline.	Observed. The species was observed once during other focused surveys, resting under a shrub, in March 2011. It was only observed the one time. Observed in the area by others during winter.	Appendix J
Circus cyaneus (nesting)	Northern harrier	None/SSC/ MSCP	Open wetlands (nesting), pasture, fields, dry uplands, grasslands, rangelands, coastal sage scrub.	Observed. Suitable foraging areas are present on site. Nesting could occur within the *Isocoma* scrub or possibly the disturbed habitat. One to three harriers were detected during almost every site visit. Observed foraging. In surveys conducted nearby from 2010–2012, west of the site, 42 observations were recorded (SDNHM and ARA 2011). No nesting was detected, but a nesting attempt was observed in 2012 off site near the dirt access road for the sewer pump station.	Appendix J

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Cistothorus palustris clarkae	Clark's marsh wren	None/SSC/ Not Covered	Narrowly distributed along the coast of Southern California. Restricted to freshwater and brackish marshes dominated by bulrushes or cattails.	Observed. Eleven individuals detected within the Otay River channel and San Diego Bay coastline immediately off site to the west. Other individuals could be present within suitable habitat in the channel.	Appendix J
Dendroica petechia brewsteri (nesting)	Yellow warbler	None/SSC/ Not Covered	Nests in lowland and foothill riparian woodlands dominated by cottonwoods, alders, and willows; winters in a variety of habitats.	Detected within the eucalyptus on site, and within the willow habitat off site to the east within the Otay River.	Appendix J
Egretta rufescens	Reddish egret	None/None/ MSCP	Saltmarsh, mudflats, coastal lagoons.	High potential to occur on site due to suitable saltmarsh, mudflat, and salt pan present on site.	Appendix J
Elanus leucurus (nesting)	White-tailed kite	None/FP/Not Covered	Open grasslands, savannah-like habitats, agriculture, wetlands, oak woodlands, riparian.	Observed. Suitable foraging areas are present on site. Nesting could occur within the eucalyptus trees on site or the riparian habitat adjacent to the site. Detected during a number of site visits and in nearby areas. Observed foraging; no nesting was detected.	Appendix J
Icteria virens (nesting)	Yellow-breasted chat	None/SSC/ Not Covered	Dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush.	Detected within the riparian habitat off site to the east within the Otay River.	Appendix J
Rallus obsoletus levipes	Light-footed Ridgway's rail	FE/SE, FP/ MSCP	Coastal saltmarsh.	Observed. Suitable marsh habitat within the channel of the Otay River. One bird was detected in an area just off site of the Otay River Floodplain Site during focused surveys.	Appendix J

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Falco columbarius	Merlin	None/WL/ Not Covered	Coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, montane hardwood-conifer habitats, ponderosa pine. Found throughout western half of California below 4,920 feet.	Observed. Observed perched just off site on a post at the western end of the site. It was only observed once. Observed by others in the winter.	Appendix J
Falco peregrinus anatum	American peregrine falcon	BCC/DL/ MSCP	Nests on cliffs, buildings, and bridges; forages in wetlands, riparian, meadows, and croplands, especially where waterfowl are present.	High potential to occur on site for foraging~~.~~; regularly observed in the general area. Species is well known to forage on shorebirds during the winter.	Appendix J ; USFWS 2006a
Gelochelidon nilotica vanrossemi	Western gull-billed tern	BCC/SSC/ Not Covered	Nests on protected spits, berms, and islands composed of sand or other small material. Forages primarily in freshwater ponds and flooded agricultural fields. Forages for small fish, crayfish, lizards, butterflies, beetles, crickets, weevils, and occasionally the young chicks of other shorebirds.	Observed. A number of individuals of the species were observed possibly foraging over or flying over the site during focused surveys for other species. Because the species was observed briefly in flight over the site, it was not mapped. Observed foraging in the area by others.	Appendix J
Passerculus sandwichensis beldingi	Belding's Savannah sparrow	None/SE/ MSCP	Saltmarsh, Pacific pickleweed.	Observed. Approximately 18 birds were observed on site or within 500 feet, and many were observed nearby off site within the San Diego Bay NWR from 2010 to 2012 (SDNHM and ARA 2011).	Appendix J
Haliaeetus leucocephalus (nesting and nonbreeding/ wintering)	Bald eagle	(FD)/SE/ MSCP	Seacoasts, rivers, swamps, large lakes; winters at large bodies of water in lowlands and mountains.	Could winter or occur on site in transit for foraging; a juvenile was photographed on site in 2013 (Collins, pers. comm. 2014).	Appendix J
Rynchops niger	Black skimmer	BCC/SSC/ Not Covered	Nests on barrier beaches, shell banks, spoil islands, and salt marsh; forages over open water; roosts on sandy beaches and gravel bars.	High potential to occur. Has been observed nearby during 2010 to 2012 surveys, and suitable foraging habitat is present within the lower reaches of the Otay River channel.	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Chlidonias niger	Black tern	None/SSC/ Not Covered	Freshwater marsh with emergent vegetation; in the Central Valley primarily breed and forage in rice fields and other flooded agricultural fields with weeds and other residual aquatic vegetation.	Moderate potential to occur. Four individuals were observed nearby in off-site areas during 2012 focused surveys (Southwest Wetlands Interpretive Association data). Limited foraging habitat on the project site.	SDNHM and ARA 2011
Branta bernicla	Brant	None/SSC/ Not Covered	Breeding habitat includes the edges of salt marshes in the low Arctic Region. Migratory habitats include shallow marine lakes. Winter range includes intertidal mudflats in shallow marine alters with abundant eelgrass and/or green algae.	Moderate potential to occur. Could occur in the area during winter months, and was observed nearby during surveys conducted from 2010 to 2012. Limited habitat occurs on site.	SDNHM and ARA 2011; USFWS 2006a
Larus californicus	California gull	None/WL/ Not Covered	Nests in alkali and freshwater lacustrine habitats; abundant in coastal and interior lowlands during nonbreeding period.	High potential to occur. Suitable habitat occurs on the north and west portions of the site. Species also observed during surveys conducted nearby off site in 2011 and 2012.	SDNHM and ARA 2011; USFWS 2006a
Eremophila alpestris actia	California horned lark	None/WL/ Not Covered	Open habitats, grassland, rangeland, shortgrass prairie, montane meadows, coastal plains, fallow grain fields.	High potential to occur on site, especially during winter. Could breed on site. Although not observed during surveys, observed to occur and breed on site by others.	Appendix J; USFWS 2006a
Sternula [=Sterna] antillarum browni (nesting colony)	California least tern	FE/SE/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats; nests on sandy beaches.	High potential. Suitable flat areas are present and the species is known in the area. Salt pans are present. Known to forage in lower portions of the Otay River channel.	Appendix J ; SDNHM and ARA 2011; USFWS 2006a
Thalasseus [=Sterna] elegans (nesting colony)	Elegant tern	BCC/WL/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats.	Observed. Suitable flat areas are present and the species is known in the area (salt pans are present). Observed flying	Appendix J

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
				over the site a number of times but did not forage on site.	
Hydroprogne caspia	Caspian tern	BCC/None/ Not Covered	Coastal estuarine, salt marsh, and barrier islands; nests on islands in rivers and salt lakes.	High potential to occur. Known to reside year-round in coastal San Diego County. Suitable marsh habitat occurs on the north and west portions of the site. Was observed nearby during surveys in 2011 and 2012. Known to forage in the lower portions of the Otay River channel.	SDNHM and ARA 2011; USFWS 2006a
Accipiter cooperii (nesting)	Cooper's hawk	None/WL/ MSCP	Riparian and oak woodlands, montane canyons.	High potential to occur within the willows that are adjacent to the site. Frequently roost and forage in neighboring suburban areas (Collins, pers. comm. 2014). High potential to forage on site and nest in adjacent riparian areas to the east. One was observed flying over the area but did not land or pause on site. It may have been hunting or may have been in transit.	Appendix J; USFWS 2006a
Passerculus sandwichensis rostratus (nonbreeding/ wintering)	Large-billed Savannah sparrow	None/SSC/ MSCP	Saltmarsh, pickleweed.	High potential to occur on site during winter due to presence of suitable habitat.	Appendix J
Numenius americanus (nesting)	Long-billed curlew	BCC/WL/ MSCP	Nests in upland shortgrass prairies and wet meadows in northeast California; winters in coastal estuaries, open grasslands, and croplands.	High potential to occur on site during the winter for foraging within the marsh areas along the Otay River channel.	Appendix J; USFWS 2006a
Charadrius alexandrinus nivosus (nesting)	Western snowy plover (coastal population)	FT,BCC/ SSC/MSCP	Nests primarily on coastal beaches, in flat open areas, with sandy or saline substrates; less commonly in salt pans, dredged spoil	High potential. Suitable flat areas are present and the species is known for the area. Salt pans are present.	Appendix J; USFWS 2006a

Table 3.3-~~9~~11
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
			disposal sites, dry salt ponds, and levees.		
Plegadis chihi (rookery site)	White-faced ibis	None/WL/ MSCP	Nests in marsh; winter foraging in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries.	High potential to occur on site during the winter for foraging within the salt pond bottom.	Appendix J; USFWS 2006a
Mammals					
Taxidea taxus	American badger	None/SSC/ MSCP	Dry, open, treeless areas; grasslands; coastal sage scrub.	Moderate potential due to sandy soils. No signs of digging were observed.	Appendix J
Chaetodipus californicus femoralis	Dulzura pocket mouse	None/SSC/ Not Covered	Coastal sage scrub, chaparral, riparian-scrub ecotone; more mesic areas.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat.	Appendix J
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	None/SSC/ Not Covered	Coastal sage scrub, grassland, sage scrub-grassland ecotones, sparse chaparral; rocky substrates, loams, and sandy loams.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat.	Appendix J
Perognathus longimembris pacificus	Pacific pocket mouse	FE/SSC/ Not Covered	Grassland, coastal sage scrub with sandy soils; along immediate coast.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat. Known locations are a long distance from the site (Camp Pendleton and southern Orange County).	Appendix J
Neotoma lepida intermedia	San Diego desert woodrat	None/SSC/ Not Covered	Coastal sage scrub, chaparral, pinyon-juniper woodland with rock outcrops, cactus thickets, dense undergrowth.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat.	Appendix J
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/SSC/ Not Covered	Arid habitats with open ground; grasslands, coastal sage scrub, agriculture, disturbed areas, rangelands.	Observed. Several jackrabbits were detected on site during surveys.	Appendix J

Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern
(FD) Federally delisted; monitored for 5 years
FE Federally listed as endangered
FT Federally listed as threatened
State Designations:
SSC California Species of Special Concern

FP California Department of Fish and Wildlife Protected and Fully Protected Species
DL State delisted
SE State listed as endangered
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Table 3.3-1~~0~~2
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Amphibians					
Spea [=Scaphiopus] hammondi	Western spadefoot	None/SSC/ Not Covered	Most common in grasslands, coastal sage scrub near rain pools or vernal pools; riparian habitats.	Low potential. Small amount of suitable habitat is present within the cismontane alkali marsh habitat.	Appendix J
Reptiles					
Salvadora hexalepis virgultea	Coast patch-nosed snake	None/SSC/ Not Covered	Chaparral, washes, sandy flats, rocky areas.	Low potential. Small amount of suitable habitat is present within the *Isocoma* scrub, but there are no rocky areas within the habitat.	Appendix J
Plestiodon skiltonianus interparietalis	Coronado Island skink	None/SSC/ Not Covered	Grassland, woodlands, pine forests, chaparral. Prefers rocky areas near streams with lots of vegetation but is also found away from water.	Low potential. Small amount of suitable habitat is present within the *Isocoma* scrub, but there are no rocky areas within the habitat.	Appendix J
Crotalus ruber	Northern red-diamond rattlesnake	None/SSC/ Not Covered	Variety of shrub habitats where there is heavy brush, large rocks, or boulders.	Low potential. Small amount of suitable habitat is present within the *Isocoma* scrub, but there are no rocky areas within the habitat.	Appendix J
Birds					
Pelecanus erythrorhynchos	American white pelican	None/SSC/ Not Covered	Nests colonially on isolated islands in freshwater lakes with sandy, earthen, or rocky substrates; minimal disturbance from humans or mammalian predators required, as is close access to productive foraging areas; forages on inland marshes, lakes, or rivers; winters on shallow coastal bays, inlets, and estuaries.	Low potential to occur due to lack of freshwater habitat and the site's proximity to urbanization.	USFWS 2006a

Table 3.3-1~~0~~2
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Laterallus jamaicensis coturniculus	California black rail	BCC/ST/ Not Covered	Saline, brackish, and fresh emergent wetlands.	Low potential due to lack of extensive emergent habitat. Species was recorded in the region but is assumed to be extirpated from San Diego County.	Appendix J
Pelecanus occidentalis californicus ~~(nesting colony and communal roosts)~~	California brown pelican	~~FE (~~FD~~)/~~/DL/ MSCP	Open sea, large water bodies, coastal bays, and harbors.	Low potential due to lack of extensive open water. Species could perch on posts located within the site or could occur within the Otay River channel, but the channel is relatively narrow. Species does occur within the region, and was observed nearby in surveys conducted in 2011 and 2012.	Appendix J; SDNHM and ARA 2011; USFWS 2006a
Polioptila californica californica	Coastal California gnatcatcher	FT/SSC/ MSCP	Coastal sage scrub, coastal sage scrub–chaparral mix, coastal sage scrub–grassland ecotone, riparian in late summer.	Low potential due to lack of suitable habitat. Focused survey conducted nearby in 2006 was negative. Species was detected off site within suitable habitat. It was observed at the southern portion of the area adjacent to the parking lot near Home Depot.	Appendix J
Gavia immer	Common loon	None/SSC/ Not Covered	Extirpated as a breeder from California; winters in coastal waters such as bays, channels, coves, and inlets; also winters inland at large, deep lakes and reservoirs.	Low potential to occur. Range has been limited in California from anthropogenic activities. Known to visit San Diego coastal areas during winter, but lacks habitat on the project site.	USFWS 2006a
Phalacrocorax auritus	Double-crested cormorant	None/WL/ Not Covered	Nests in riparian trees near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines; winter habitat includes lakes, rivers, and coastal areas.	Low potential to occur. Was observed during surveys nearby off site from 2010 to 2012. Limited suitable habitat on site.	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-1~~0~~2
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Buteo regalis (nonbreeding/ wintering)	Ferruginous hawk	BCC/WL/ MSCP	Open, dry country; grasslands; open fields; agriculture.	May forage on site during migration or for wintering. Does not breed in the region.	Appendix J
Aquila chrysaetos (nesting and nonbreeding/ wintering)	Golden eagle	BCC/WL/ MSCP	Open country, especially hilly and mountainous regions; grassland, coastal sage scrub, chaparral, oak savannas, open coniferous forest.	Low potential. May forage over the site but no nesting habitat is present.	Appendix J
Ammodramus savannarum (nesting)	Grasshopper sparrow	None/SSC/ Not Covered	Open grassland and prairie, especially native grassland with a mix of grasses and forbs.	Low potential due to lack of suitable grassland habitat.	Appendix J
Vireo bellii pusillus (nesting)	Least Bell's vireo	FE, BCC/SE/ MSCP	Nests in southern willow scrub with dense cover within 1–2 meters of the ground; habitat includes willows, cottonwoods, baccharis, wild blackberry, or mesquite on desert areas.	Low potential due to lack of suitable habitat. Suitable habitat is located off site to the east within the channel of the Otay River, but this habitat is limited. Focused surveys were negative.	Appendix J
Lanius ludovicianus	Loggerhead shrike	BCC/SSC/ Not Covered	Nests and forages in open habitats with scattered shrubs, trees, or other perches.	Low potential to occur. Limited perching structures and suitable habitat occur across the project site.	USFWS 2006a
Charadrius montanus (nonbreeding/ wintering)	Mountain plover	BCC/SSC/ MSCP	Nests in open, shortgrass prairies or grasslands; winters in shortgrass plains, plowed fields, open sagebrush, and sandy deserts.	Low potential. Does not nest within the region but may forage on site during winter.	Appendix J
Aythya americana	Redhead	None/SSC/ Not Covered	Breeds in relatively deep (>3 feet) permanent or semi-permanent wetlands of at least 1 acre, with about 75% open water and emergent tules, bulrushes (*Scirpus* spp.), and cattails (*Typha* spp.) up to about 3 feet in height; winters in coastal estuaries and large, deep ponds, lakes, and reservoirs of the interior.	Low potential to occur. Limited suitable habitat occurs on the site. Seven individuals were observed nearby off site in surveys conducted from 2011 to 2012, but none were detected in surveys covering the same area in 2010.	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-1~~0~~2
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Accipiter striatus	Sharp-shinned hawk	None/WL/ Not Covered	Nests in coniferous forests, ponderosa pine, black oak, riparian deciduous, mixed conifer, Jeffrey pine; winters in lowland woodlands and other habitats.	Low potential to occur due to lack of suitable habitat on the project site or nearby areas. Could forage on site during migration or winter.	USFWS 2006a
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	None/WL/ MSCP	Grass-covered hillsides, coastal sage scrub, chaparral with boulders and outcrops.	Low potential due to small amount of habitat in the *Isocoma* scrub area.	Appendix J
Buteo swainsoni (nesting)	Swainson's hawk	BCC/ST/ MSCP	Open grassland, shrublands, croplands.	May forage on site during migration. Does not breed in the region.	Appendix J
Agelaius tricolor (nesting colony)	Tricolored blackbird	BCC/SSC/ MSCP	Nests near fresh water, emergent wetland with cattails or tules; forages in grasslands, woodland, and agriculture.	Low potential. Small amount of suitable habitat is present.	Appendix J
Mammals					
Nyctinomops macrotis	Big free-tailed bat	None/SSC/ Not Covered	Rugged, rocky canyons.	No roost habitat is present but could forage on site or overhead.	Appendix J
Choeronycteris mexicana	Mexican long-tongued bat	None/SSC/ Not Covered	Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon–juniper woodland. Roosts in caves, mines, and buildings.	No roost habitat is present but could forage on site or overhead.	Appendix J
Felis concolor	Mountain lion	None/None/ MSCP	Occupies a wide variety of habitats: swamps, riparian woodlands, broken country with good cover of brush or woodland.	Low potential due to location in an urbanized area. Cover is limited on site.	Appendix J
Antrozous pallidus	Pallid bat	None/SSC/ Not Covered	Rocky outcrops, cliffs, and crevices with access to open habitats for foraging.	No roost habitat is present but could forage on site or overhead.	Appendix J
Nyctinomops femorosaccus	Pocketed free-tailed bat	None/SSC	Rocky desert areas with high cliffs or rock outcrops.	No roost habitat is present but could forage on site or overhead.	Appendix J
Euderma maculatum	Spotted bat	None/SSC/ Not Covered	Arid deserts and grasslands through mixed conifer forests; roosts in cliffs, feeds over water and along washes.	No roost habitat is present but could forage on site or overhead.	Appendix J

Table 3.3-1~~0~~2
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur	Source
Eumops perotis californicus	Western mastiff bat	None/SSC/ Not Covered	Roosts in small colonies in cracks and small holes, seeming to prefer artificial structures.	No roost habitat is present but could forage on site or overhead.	Appendix J
Lasiurus blossevillii	Western red bat	None/SSC/ Not Covered	Roosts in forests and woodlands from sea level up through mixed conifer forests. Feeding habitat variable and includes grasslands, shrublands, open woodlands and forests, and croplands. Not found in desert areas.	No roost habitat is present but could forage on site or overhead.	Appendix J
Invertebrates					
Panoquina errans	Wandering (saltmarsh) skipper	None/None/ MSCP	Occurs strictly in coastal salt marsh habitat where salt grass (*Distichlis spicata*) occurs and functions as the host plant. Marshes with tidal flow are the more likely occupied areas.	Low potential. Some limited areas of the host plant present within the edges of the saltmarsh habitat. In general, salt grass is mixed in with other plant species and does not exist as an isolated stand. Locations where ~~observed as a~~ component species are present around the margins of the salt marsh vegetation that line the Otay River and Nestor Creek channels~~.~~ were surveyed.	Appendix J

Federal Designations:
BCC U.S. Fish and Wildlife Service: Birds of Conservation Concern
(FD) Federally delisted; monitored for 5 years
FE Federally listed as endangered
FT Federally listed as threatened
State Designations:
SSC California Species of Special Concern
DL State delisted
SE State listed as endangered
ST State listed as threatened
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Focused surveys were not conducted within the Pond 15 Site ~~due to limited access to the site~~, but comprehensive bird surveys ~~have been~~are conducted annually within the salt pond complex by the Service, as summarized in Tables 3.3-13~~1~~ and 3.3-14~~2~~. Nesting locations of birds from 2015 are shown on Figure 3.3-16~~5~~, Otay River Floodplain Site Bird Nesting Locations, ~~and~~ Figure 3.3-17~~6~~, Pond 15 Site Bird Nesting Locations (Patton 2015). Additional nesting data is provided in Table 3.3-8.

Table 3.3-1~~1~~3
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Reptiles					
Chelonia mydas	Eastern Pacific green sea turtle	~~FE~~FT/None/ None	Shallow waters of bays, reefs, inlets, and undisturbed sandy beaches for egg laying.	Has been documented within San Diego Bay.	Appendix J
Birds					
Falco peregrinus anatum	American peregrine falcon	BCC/DL/ MSCP	Nests on cliffs, buildings, bridges; forages in wetlands, riparian, meadows, and croplands, especially where waterfowl are present.	High potential to occur on site for foraging. Species is well known to forage on shorebirds ~~during the winter.~~year round. Individuals observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a
Circus cyaneus (nesting)	Northern harrier	None/SSC/ MSCP	Open wetlands (nesting), pasture, fields, dry uplands, grasslands, rangelands, coastal sage scrub.	Low potential to nest within Pond 15 site; however forages over the site.	SDNHM and ARA 2011
Falco columbarius	Merlin	None/WL/ Not Covered	Coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, montane hardwood-conifer habitats, ponderosa pine. Found throughout western half of California below 4,920 feet.	Regularly observed in winter.	Patton pers. comm

Table 3.3-1~~1~~3
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Asio flammeus	Short-eared owl	None/SSC/ Not Covered	Open areas with few trees, such as grasslands, irrigated lands, saline and fresh emergent wetlands. Uncommon winter migrant in Southern California, and widespread during winter in Central Valley and coastline.	Observed during winter at the salt works.	Patton pers. comm
Egretta rufescens	Reddish egret	None/None/ MSCP	Saltmarsh, mudflats, coastal lagoons.	High potential to occur on site due to suitable saltmarsh, mudflat, and salt pan present on site. Observed by others on the adjacent mudflats.	Patton pers. comm
Pelecanus erythrorhynchos	American white pelican	None/SSC/ Not Covered	Nests colonially on isolated islands in freshwater lakes with sandy, earthen, or rocky substrates; minimal disturbance from humans or mammalian predators required, as is close access to productive foraging areas; forages around inland marshes, lakes, or rivers; winters on shallow coastal bays, inlets, and estuaries.	Historically observed roosting on the levees of the salt pond complex. Moderate potential to roost on the levees of the Pond 15 Site.	USFWS 2006a
Passerculus sandwichensis beldingi	Belding's Savannah sparrow	None/SE/ MSCP	Nests and forages in coastal salt marsh dominated by Pacific pickleweed.	Documented as occurring within Pond 15 Site; suitable salt marsh habitat occurs in a small area on site. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011). 211 birds were recorded in 2012. 2015 territory locations are shown on Figure 3.3-16.	SDNHM and ARA 2011; USFWS 2006a
Rynchops niger	Black skimmer	BCC/SSC/ Not Covered	Nests on barrier beaches, shell banks, spoil islands, and salt marsh; forages over open water; roosts on sandy beaches and gravel bars.	High potential to occur. Observed during surveys conducted from 2010 to 2012 (Southwest Wetlands Interpretive Association data); some	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-1~~1~~3
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
				suitable nesting areas occur on the southwestern end of the project site, and foraging occurs within the open water areas of the salt pond complex. 2015 nesting locations are shown on Figures 3.3-15 and 3.3-16.	
Chlidonias niger	Black tern	None/SSC/ Not Covered	Freshwater marsh with emergent vegetation; in the Central Valley primarily breeds and forages in rice fields and other flooded agricultural fields with weeds and other residual aquatic vegetation.	Moderate potential to occur. Four individuals were observed flying over the area during 2012 focused surveys (Appendix J). Some foraging habitat occurs on the project site. Was not recorded during surveys of the site in 2010–2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a
Branta bernicla	Brant	None/SSC/ Not Covered	Breeding habitat includes the edges of salt marshes in the low Arctic region. Migratory habitats include shallow marine lakes. Winter range includes intertidal mudflats in shallow marine alters with abundant eelgrass and/or green algae.	Moderate potential to occur. Could occur in the area during winter and was observed adjacent to the salt ponds during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011). Suitable migratory habitat occurs within project site.	SDNHM and ARA 2011; USFWS 2006a
Pelecanus occidentalis californicus (nesting colony and communal roosts)	California brown pelican	~~FE (~~FD~~)/~~/DL/ MSCP	Open sea, large water bodies, coastal bays, and harbors.	High potential to occur over open water areas on the project site; has been observed roosting on the salt pond levees. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-1~~1~~3
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Larus californicus	California gull	None/WL/ Not Covered	Nests in alkali and freshwater lacustrine habitats; abundant in coastal and interior lowlands during nonbreeding period.	High potential to occur. Suitable habitat occurs on the north and west portions of the site. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a
Eremophila alpestris actia	California horned lark	None/WL/ Not Covered	Open habitats, grassland, rangeland, shortgrass prairie, montane meadows, coastal plains, fallow grain fields.	High potential to occur on site, especially during winter. Individuals observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a
Sternula [=Sterna] antillarum browni (nesting colony)	California least tern	FE/SE/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats; nests on sandy beaches.	High potential. Suitable flat areas are present and the species is known to nest in the general area. Individuals were observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011). 2015 nesting locations are shown on Figures 3.3-15 and 3.3-16.	SDNHM and ARA 2011; USFWS 2006a
Hydroprogne caspia	Caspian tern	BCC/None/ Not Covered	Coastal estuarine, salt marsh, and barrier islands; nests on islands in rivers and salt lakes.	High potential to occur. Known to reside year-round in coastal San Diego County. Suitable foraging and nesting habitat occurs on the north and western portions of the site. Was observed nearby during surveys in 2011 and 2012 (SDNHM and ARA 2011). 2015 nesting locations are shown on Figure 3.3-16.	SDNHM and ARA 2011; USFWS 2006a
Gelochelidon nilotica vanrossemi	Western gull-billed tern	BCC/SSC/Not Covered	Nests on protected spits, berms, and islands composed of sand or other small material. Forages primarily in freshwater ponds and	High potential to occur. Suitable foraging and nesting habitat occurs on the north and western portions of the site. Was observed nearby during	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-1~~1~~3
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
			flooded agricultural fields. Forages for small fish, crayfish, lizards, butterflies, beetles, crickets, weevils, and occasionally the young chicks of other shorebirds.	surveys in 2011 and 2012 (SDNHM and ARA 2011). 2015 nesting locations are shown on Figure 3.3-16.	
Phalacrocorax auritus	Double-crested cormorant	None/WL/ Not Covered	Nests in riparian trees near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines; winter habitat includes lakes, rivers, and coastal areas.	High potential to occur. Large numbers of individuals were observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011), and suitable habitat occurs on the project site. 2015 nesting locations are shown on Figure 3.3-16.	SDNHM and ARA 2011; USFWS 2006a
Thalasseus [=Sterna] elegans (nesting colony)	Elegant tern	BCC/WL/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats.	High potential to occur. Large numbers of individuals were observed during surveys conducted from 2010 to 2012 (Southwest Wetlands Interpretive Association data), and suitable habitat occurs on the project site. 2015 nesting locations are shown on Figure 3.3-16.	SDNHM and ARA 2011; USFWS 2006a
Passerculus sandwichensis rostratus (nonbreeding/ wintering)	Large-billed Savannah sparrow	None/SSC/ MSCP	Saltmarsh, pickleweed.	Moderate potential to occur on site during winter due to presence of some suitable habitat on site. Not recorded for the site in 2010–2012.	SDNHM and ARA 2011
Numenius americanus (nesting)	Long-billed curlew	BCC/WL/ MSCP	Nests in upland shortgrass prairies and wet meadows in northeast California; winters in coastal estuaries, open grasslands, and croplands.	High potential to occur on site during winter for foraging within marsh areas. Individuals were observed during focused surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a

Table 3.3-1~~1~~3
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Aythya americana	Redhead	None/SSC/ Not Covered	Breeds in relatively deep (>3 feet) permanent or semi-permanent wetlands of at least 1 acre with about 75% open water and emergent tules, bulrushes (*Scirpus* spp.), and cattails (*Typha* spp.) up to about 3 feet in height; winters in coastal estuaries and large, deep ponds, lakes, and reservoirs of the interior.	Moderate potential to occur. Limited suitable habitat occurs on site. Seven individuals were observed during surveys conducted in 2012 (SDNHM and ARA 2011), but none were detected in surveys covering the same area in 2010.	SDNHM and ARA 2011; USFWS 2006a
Charadrius alexandrinus nivosus (nesting)	Western snowy plover (coastal population)	FT, BCC/SSC/ MSCP	Nests primarily on coastal beaches in flat, open areas with sandy or saline substrates; less commonly in salt pans, dredged spoil disposal sites, dry salt ponds, and levees.	High potential. Suitable flat areas are present and the species is known to nest and forage near the site, but has not been recorded on the site. 2015 nesting locations are shown on Figures 3~~.~~.3-15 and 3.3-16.	USFWS 2006a

Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern
(FD) Federally delisted; monitored for 5 years
FE Federally listed as endangered
FT Federally listed as threatened
State Designations:
SSC California Species of Special Concern
DL State delisted
SE State listed as endangered
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Table 3.3-1~~2~~4
Special-Status Wildlife with Low Potential or No Potential to Occur on the Pond 15 Site but That Have Been Recorded at the South Bay Salt Works

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Birds					
Gavia immer	Common loon	None/SSC/ Not Covered	Extirpated as a breeder from California; winters in coastal waters such as bays, channels, coves, and inlets; also winters inland at large, deep lakes and reservoirs.	Low potential to occur. Range has been limited in California from anthropogenic activities. Known to visit San Diego coastal areas during winter, but lacks significant suitable habitat on the project site.	USFWS 2006a
Accipiter cooperii (nesting)	Cooper's hawk	None/WL/ MSCP	Riparian and oak woodlands, montane canyons.	No potential to occur on site for breeding. Could forage on site and nest in nearby woodland areas to the east.	SDNHM and ARA 2011; USFWS 2006a
Plegadis chihi (rookery site)	White-faced ibis	None/WL/ MSCP	Nests in marsh; winter foraging in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries.	Low potential to occur on site during the winter for foraging within the marsh areas due to the small size of the area. Was not observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).	SDNHM and ARA 2011; USFWS 2006a
Athene cunicularia (burrow sites and some wintering sites)	Burrowing owl	BCC/SSC/ MSCP	Grassland, lowland scrub, agriculture, coastal dunes, and other artificial open areas.	Low potential to occur within Pond 15 Site, but has been recorded in the region. Three were observed nearby in off-site surveys conducted in 2011.	SDNHM and ARA 2011
~~*Circus cyaneus* (nesting)~~	~~Northern harrier~~	~~None/SSC/ MSCP~~	~~Open wetlands (nesting), pasture, fields, dry uplands, grasslands, rangelands, coastal sage scrub.~~	~~Low potential to nest within Pond 15 Site,~~; ~~however might forage near or over the site.~~	~~SDNHM and ARA 2011~~
Cistothorus palustris clarkae	Clark's marsh wren	None/SSC/ Not Covered	Narrowly distributed along the coast of Southern California. Restricted to freshwater and brackish marshes dominated by bulrushes or cattails.	Low potential to nest within Pond 15 Site, but might forage near the site.	SDNHM and ARA 2011

Table 3.3-1~~2~~4
Special-Status Wildlife with Low Potential or No Potential to Occur on the Pond 15 Site but That Have Been Recorded at the South Bay Salt Works

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur	Source
Elanus leucurus (nesting)	White-tailed kite	None/FP/Not Covered	Open grasslands, savannah-like habitats, agriculture, wetlands, oak woodlands, riparian.	Low potential to nest within Pond 15 Site, but might forage near the site.	SDNHM and ARA 2011
Rallus obsoletus levipes	Light-footed Ridgway's rail	FE/SE, FP/ MSCP	Coastal saltmarsh.	Low potential to nest within Pond 15 Site, but ~~might forage near~~known to be present in the ~~site.~~ adjacent Palomar channel.	SDNHM and ARA 2011
Invertebrates					
Panoquina errans	Wandering (saltmarsh) skipper	None/None/ MSCP	Occurs strictly in coastal salt marsh habitat where salt grass (*Distichlis spicata*) occurs and functions as the host plant. Marshes with tidal flow are the more likely occupied areas.	Low potential. There are some limited areas of the host plant present mixed in with other plant species, but it does not exist as an isolated stand.	Appendix J

Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern
FE Federally listed as endangered
State Designations:
SSC California Species of Special Concern
FP California Department of Fish and Wildlife Protected and Fully Protected Species
SE State listed as endangered
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Other areas of the salt pond complex that could be affected by project activities include those levees identified as part of the two potential routes that could be used for conveyor belt transport of material from the Otay River Floodplain Site to the Pond 15 Site. Based on comprehensive bird nesting surveys conducted between 2006 and 2017 within the salt pond complex, both routes would use levees that support California least tern, western snowy plover, and other seabird nesting. Use of the levees for nesting varies from year to year; however, the presence of these nesting species on the affected levees in any given year is relatively high, as indicated in Table 3.3-8.

3.3.3.1 Plants

Otay River Floodplain Site

Dudek biologists Andy Thomson and Katie Dayton surveyed the Otay River Floodplain Site for special-status plant species on May 19, 2011. No ~~Federally~~federally or State-listed plant species were observed on the Otay River Floodplain Site. Three special-status plant species were observed in the Otay River Floodplain Site, as listed in Table 3.3-7, Special-Status Plants Detected or Potentially Occurring on the Project Site: California box-thorn (*Lycium californicum*), estuary seablite, and woolly seablite (*Suaeda taxifolia*). The locations of these plants are shown on Figure 3.3-12 ~~1~~.

Pond 15 Site

Dudek biologists Andy Thomson and Katie Dayton surveyed the Pond 15 Site for special-status plant species on March 13, 2013. No ~~Federally~~federally or State-listed plant species were observed on the Pond 15 Site. One special-status plant species was observed in the Pond 15 Site, as listed in Table 3.3-9 ~~7~~: estuary seablite. The locations of the plant species are shown in Figure 3.3-13 ~~2~~.

3.3.3.2 Wildlife

Otay River Floodplain Site

Dudek biologists Anita Hayworth, Stuart Fraser, Kevin Shaw, and Thomas Liddicoat, and subconsultant John Konecny surveyed the Otay River Floodplain Site for special-status wildlife species February through July 2011 (Appendix J). A total of 23 visits were made to the site to conduct protocol surveys for Belding's Savannah sparrow, burrowing owl, least Bell's vireo, California gnatcatcher, northern harrier, and light-footed Ridgway's rail. During these visits, two ~~Federally~~federally or State-listed species were observed on or adjacent to the site: light-footed Ridgway's rail and Belding's Savannah sparrow. Additionally, two other special-status wildlife species were observed on the site and five species were observed within 500 feet of the site (Table 3.3-11 ~~9~~, Special-Status Wildlife Detected or Potentially Occurring on the Otay River Floodplain Site). Figure 3.3-15 ~~4~~, Otay River Floodplain Site Special-Status Wildlife Species, indicates where the special-status wildlife species were observed. Special-status species that were not observed during focused surveys or for which there is no suitable habitat are listed in Table 3.3-12 ~~0~~, Special-Status Wildlife with Low Potential to Occur on the Otay River Floodplain Site (USFWS 2006a).

A brief discussion of the natural history of the ~~Federally~~federally or State-listed species is provided in this section.

Light-Footed Ridgway's Rail

Light-footed Ridgway's rail inhabits coastal salt marshes in Southern California and northern Baja California, Mexico. In California, its range includes coastal Ventura County, Orange County, and San Diego County. Although historically present in Los Angeles County, this rail has not been observed there since 1983 (Zembal et al. 2009). Distribution within its range is discontinuous because salt marsh habitats occur sporadically along the coastline.

This rail relies on coastal salt marshes, lagoons, and estuaries for nesting and foraging habitat year-round. It prefers nesting habitats located in the zone below the high water mark that have thick cordgrass that can be used for cover (USFWS 2009). It is also known to nest in coastal marshland dominated by pickleweed and saltwort. Typically these birds forage for crustaceans and other invertebrates in shallow water areas and mudflats that are regularly inundated with flooding water, usually tidal, and they do not stray far from their nesting territories (USFWS 2006a, 2009).

Light-footed Ridgway's rail was listed as ~~Federally~~federally endangered on October 13, 1970, and as endangered in California on June 27, 1971. This rail is also a covered species under the San Diego MSCP. In the 1980s, the population was estimated at fewer than 200 breeding pairs, with these low numbers attributed primarily to coastal wetlands destruction and degradation. In 2015, a total of 633 pairs of light-footed Ridgway's rails exhibited breeding behavior in 22 marshes throughout its known range (Zembal et al. 2015). This is the first time in 40 years that the total number of breeding pairs has exceeded 600, but this is still below 800 pairs, which the Light-Footed Clapper Rail [now referred to as Light-Footed Ridgway's Rail] Recovery Plan (USFWS 1985) suggests is the level at which downlisting from endangered to threatened status could be considered.

The 5-year review of this species conducted by the Service in 2009 indicated that progress has been made to increase the number of light-footed Ridgway's rails since listing, and regulatory mechanisms have been successful for stopping destruction and adverse modification of marsh lands (USFWS 2009). Conservation efforts, including habitat restoration such as the restoration of 223 acres of salt marsh habitat in the western salt ponds on the South San Diego Bay Unit of the San Diego Bay NWR, have been implemented to support the recovery of this species.

Of the 22 marshes in which rails were encountered in 2015, nine supported five or fewer pairs, seven supports six to 15 pairs, and six supported between 33 and 234 pairs (Zembal et al. 2015).

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 3.3-14

Ponds 22 and 23 Site Special-Status Plant Species

Otay River Estuary Restoration Project EIS

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AERIAL SOURCE: BING MAPPING SERVICE

Figure 3.3-16

Otay River Floodplain Restoration Site Special Status Nesting Locations

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AERIAL SOURCE: BING MAPPING SERVICE

Figure 3.3-17

Pond 15 Restoration Site Special Status Nesting Locations

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Isolated subpopulations occur within the San Diego Bay NWR, including along the Otay River. Single pairs of rails were detected along portions of the Otay River channel in the vicinity of the Otay River Floodplain Site in 2011, 2012, 2014, and 2015, and during many previous years (Zembal et al. 2015). Rail calling has also been documented in past years from the vicinity of the Bayshore Bikeway overcrossing of the river channel, just south of the South Bay Salt Works. Light-footed Ridgway's rail activity along the Otay River channel where it flows between the restored western ponds and the eastern ponds has also occurred annually in recent years, and in 2015, a single rail chick was observed in the general vicinity (Collins, pers. comm. 2015). There is also a breeding population in the South Bay Biological Study Area, located just to the north of the restored western salt ponds on the South San Diego Bay Unit (typically two to five breeding pairs were identified each year from 1999 through 2004) (USFWS 2006a). At least one breeding pair was present in the area from 2005 through 2007 and 2009 through 2011. Three pairs were vocal in 2012, and there were two pairs in 2013, 2014, and 2015 (Zembal et al. 2015). Three of five satellite telemetered rails that were released into the South San Diego Bay Unit in October 2016 were still transmitting as of late July 2017. One bird location is centered on the Palomar drainage between Ponds 28/29 and Pond 15. Another is located in the southeastern portion of the Otay River flood control channel and the third seems to be most active in the western salt pond restoration area and along the Otay River flood control channel north of the northern terminus of 8th Street in Imperial Beach.

Belding's Savannah Sparrow

Belding's Savannah sparrow is one of only two wetland-dependent avian species that reside year-round in the coastal salt marshes of Southern California (Powell and Collier 1998). This subspecies of Savannah sparrow is a salt marsh endemic that ranges along the Southern California coast from Santa Barbara County (Goleta Slough) in the north to El Rosario, Baja California, Mexico, in the south (James and Stadtlander 1991).

Belding's Savannah sparrow prefers to nest in the mid- to upper-littoral zones of coastal salt marshes (Powell and Collier 1998), generally within dense stands of pickleweed. Breeding territories can be very small, with the birds nesting semi-colonially or locally concentrated within a larger block of habitat (Zembal and Hoffman 2002). The breeding season for this subspecies is generally defined as March 1 through September 1. Their secretive nature and the fact that they forage throughout a marsh, often well away from nesting sites, makes counting individuals and breeding territories somewhat difficult (Zembal and Hoffman 2010).

Based on a dramatic decrease in the Belding's Savannah sparrow population in the 1970s, this subspecies was listed as endangered by California in 1974 (Zembal et al. 1988). The population decrease was attributed to the development, degradation, and fragmentation of coastal salt marsh habitat. The subspecies has no status under the Federal Endangered Species Act, but is a covered species under the San Diego MSCP.

Statewide, the number of Belding's Savannah sparrows has increased since 1973 from only 1,084 territories to 3,372 territories in 2010 (Zembal and Hoffman 2010). During the 2010 survey, 169 Belding's Savannah sparrow territories, representing the seventh largest subpopulation in California, were identified within the portion of the South San Diego Bay Unit that includes the Otay River channel from just east of Nestor Creek to the north end of Ponds 11 and 12, and in the salt marsh vegetation that abuts the salt pond levees (Zembal and Hoffman 2010). This is a 141% increase over the 2006 count. Within this area, this subspecies was concentrated along the Otay River channel and the Palomar drainage channel that abuts Pond 15. The habitat along the outer edge of the South Bay Salt Works has supported numerous territories in the past, but the habitat was very sparse, with isolated *Salicornia* and shrubby weeds scattered widely (Zembal and Hoffman 2010). Figure 3.3-1~~5~~6 indicates where Belding's Savannah sparrows were identified on and adjacent to the Otay River Floodplain Site.

Pond 15 Site

~~Due to limited accessibility to the Pond 15 Site, focused~~Focused wildlife surveys were not conducted by Dudek staff within the Pond 15 Site. However, observation data was available through State and Federal agencies (San Diego Natural History Museum and Avian Research Associates (SDNHM and ARA 2011~~)~~)) and through California Natural Diversity Database records (CDFW 2014b), and nesting location records were obtained from the San Diego Bay NWR (Patten, pers. comm. 2014) (Figure 3.3-16). ~~Three Federally~~Four federally or State-listed species have been observed within or in wetland habitat adjacent to the Pond 15 Site (California least tern, light-footed Ridgway's rail, western snowy plover, and Belding's Savannah sparrow), and one ~~Federally~~federally listed threatened species, East Pacific green turtle (*Chelonia mydas*), has been recorded in the bay adjacent to the Pond 15 Site. These species are discussed below.

Species that have been recorded at the Pond 15 Site or that have potential to occur are summarized in Table 3.3-1~~1~~3. Those species that have not been recorded at the Pond 15 Site or for which there is no potential to occur are summarized in Table 3.3-1~~2~~4.

In addition to the listed species that occur in and around the Pond 15 Site, nine special-status wildlife species were observed on site during the surveys conducted in 2010–2012, as listed in Table 3.3-1~~1~~3, Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site. Special-status species within the salt pond complex that have high potential to occur within the Pond 15 Site are based on previous observations: American peregrine falcon (*Falco peregrinus anatum*), black skimmer, California brown pelican, California gull, California horned lark (*Eremophila alpestris actia*), Caspian tern, western gull-billed tern, double-crested cormorant, elegant tern, and long-billed curlew (*Numenius americanus*). Species that are not special status but that have been recorded nesting within the Pond 15 Site or in proximity include royal tern and Forster's tern. Nesting locations of special-status and non-special-status species have been documented by the San Diego Bay NWR and are shown in Figure 3.3-1~~6~~7. This figure shows the importance of the ~~South Bay Salt Works~~salt pond complex and the levee system within it for the nesting of a number of special-status and common bird species. Species for which the levee system provides nesting habitat include the ground nesting endangered California least tern and the threatened western snowy plover.

California Least Tern

California least tern is a migratory tern species that breeds in the United States only along the immediate coast of California from San Francisco Bay south to the Mexican border. It usually arrives at its breeding areas in April (although monitoring efforts for this species begin in March), and generally departs in August for the coast of Central or South America (Thompson et al. 1997). Least terns are colonial but do not nest in as dense a concentration as many other tern species. The nest is a simple scrape or depression in the sand, and birds lay one to four eggs, usually two.

The smallest of the tern species, California least tern, is an exclusive fish-eater that relies on a number of fish species (e.g., topsmelt [*Atherinops affinis*], northern anchovy [*Engraulis mordax*], jacksmelt [*Atherinopsis californiensis*], gobies) in a variety of sizes as its primary food source (Atwood and Kelly 1984; Massey 1974). When they are juveniles, California least terns require a source of smaller fish as they learn to hunt for themselves. The need to locate smaller fish appears to result in the increased use of freshwater marsh systems, lagoons, and estuarine areas during the post-breeding dispersal phase, suggesting the importance of such habitats when juveniles are learning to fish (USFWS 2006a).

California least terns are known to nest along sandbanks, in dried mudflats, in gravel, and in sand pits in flat areas clear of significant vegetation in bay and inlet areas along the coast of California. They are social birds that forage, roost, and nest in colonies, typically consisting of approximately 25 pairs, but varying widely from a low of 3 to a high of 64 pairs (USFWS 2006b). Because of the movements of the individual birds, the actual colony size is somewhat arbitrary and difficult to define; thus, nesting sites are described in terms of geographic clusters of sites (USFWS 2006b). California least terns require both secure nesting habitat and open foraging habitat for juveniles and adults to congregate and disperse (USFWS 2006b).

Historically, the species is known to have nested discontinuously throughout the California coastal zone, including in relatively undisturbed sandy beaches near estuaries, bays, and inlets, with the majority of the numbers occurring between Santa Barbara and San Diego Counties

(USFWS 2006a). Statewide, numbers were in the tens of thousands before the 1960s. Beginning in the 1960s, suitable nesting areas were lost to coastal development and intense human recreational use of beaches. As a result, the tern's numbers diminished from uncountable thousands to several hundred by 1970, when California least tern was added to the Federal Endangered Species List. It is also listed as endangered by California and is a covered species under the San Diego MSCP. Today, the species is known to occur in limited areas along the Central and Southern California coastline.

Prior to the establishment of the San Diego Bay NWR, 60 pairs of least terns were recorded nesting on the levees of South Bay Salt Works in 1968. However, when surveyed again in 1970, only two breeding pairs were seen. These numbers have fluctuated over the years (between 1999 and 2014), with the lowest number of nests, 25, recorded in 1999, and the highest number of nests, 102, recorded in 2008. Only 35 nests were documented in 2014 (Patten, pers. comm. 2014).

California least tern monitoring is conducted annually at South Bay Salt Works from March through September. In 2013, least terns were first observed at South Bay Salt Works on April 21, 2013, and were observed each visit after that through August 7, 2013, then reported over the western ponds on August 23, 2013. California least terns have also been observed foraging in the Otay River channel to the north of the Otay River Floodplain Site by Dudek biologists during surveys for other species.

California least tern has been documented nesting in the immediate vicinity of the Pond 15 Site between 1999 and the present. In 2013, 18 nests were established near the wooden bridge/sluice on the southeast edge of Pond 25, which is located directly south of the Pond 15 Site; on the east edges of Ponds 26 and 27; and on the western edge of Pond 30. Nesting locations from 2015 are provided in Figure 3.3-1~~6~~7. Least terns also nest on various levees along potential conveyor belt routes as addressed in Section 3.3.3.

Western Snowy Plover

The Pacific Coast population of western snowy plover breeds from Damon Point, Washington, south to Bahia Magdalena, Baja California, Mexico (including on both the Pacific and Gulf of California coasts), and winters mainly in coastal areas from southern Washington to Central America (USFWS 2007a). Its breeding season can generally be described as occurring from March 1 through September 15 in any given year, with the earliest nests on the California coast occurring during the first week of March in some years, and by the third week of March in most years (USFWS 2007a).

Nests occur primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. In winter, western snowy plovers are found on many of the beaches used for nesting, as well as on beaches where they do not nest, in artificially created salt ponds, and on estuarine sand and mud flats.

In Southern California, western snowy plovers nest in areas with 6% to 18% vegetative cover and 1% to 14% inorganic cover; vegetation height is usually less than 6 centimeters (2.3 inches) (USFWS 2007a). Nests consist of a shallow scrape or depression, sometimes lined with beach debris (e.g., small pebbles, shell fragments, plant debris, and mud chips); nest lining increases as incubation progresses. Driftwood, kelp, and dune plants provide cover for chicks that crouch near objects to hide from predators. The species forages in coastal areas using a run-and-glean strategy for preying on invertebrates. Their young are precocial and begin foraging within hours of hatching under the direction and supervision of adults (USFWS 2007a).

Human disturbance, predation, and inclement weather, combined with the loss of nesting habitat to urban development and the encroachment of introduced beachgrass (*Ammophila arenaria*), led to a decline in the breeding and wintering populations of western snowy plover along the Pacific Coast. In Southern California, the very large human population and resulting recreation activities have precluded western snowy plover from breeding on historic beach strand nesting habitat. As a result, the Pacific Coast population of western snowy plover was ~~Federally~~federally listed as threatened in 1993, and remains listed today as both ~~Federally~~federally threatened and as a California Species of Special Concern (Shuford and Gardali 2008). Western snowy plover is also a covered species under the San Diego MSCP.

Western snowy plover has nested on the salt pond levees within the San Diego Bay NWR during most years between 1999 and 2014. Between 1999 and 2010, the number of nests never exceeded nine in any given year. However, beginning in 2011, the number of nests has steadily increased from 25 in 2011 to 61 in 2014 (Patten, pers. comm. ~~2014~~2014) and increasing to 147 in 2017 (B. Collins pers. comm 2017).

Based on the maximum number of concurrently active nests and broods, at least 14 female and 24 male snowy plovers bred within the South Bay Salt Works in 2013. At least 45 nests were initiated from late March to mid-July 2013. The densest nesting was on the expanse of waste salt deposited at the south-southwest edge of Pond 20, located just to the north of the Otay River Floodplain Site (Figure 3.3-16), where 16 nests were established. The color, pattern, and texture of the substrate in this area made eggs and chicks exceedingly difficult to detect and likely contributed to the season’s success. At least 101 chicks hatched from 38 nests, and at least 21 to 22 young of 14 to 15 broods are estimated to have fledged in 2013. The reason for failure of several nests may have been predation, noted based on either direct or indirect observation or sign such as coyote tracks. The maximum number of plovers observed early in the season before nests were established was 7 on March 22, 2013; late-season maximum numbers were at least 46 to 49, with 9 fledglings on July 17, 2013 (Patten, pers. comm. 2014).

Western snowy plover has also established nests in the vicinity of the Pond 15 Site. In 2013, plover nests were established in the vicinity of the bridge, including on the road shoulders of north Pond 41 and south Pond 30, on the road northeast of the bridge/sluice and east of Pond 25, on the northwestern levee of Pond 30, and on the southeast shore of and on salt crust in southeastern Pond 27 (Patten, pers. comm. 2014). Another nest was established near the southwest corner of Pond 15. Nesting locations from 2015 are shown in Figure 3.3-1~~6~~7. Western snowy plovers also nest on various levees along potential conveyor belt routes as addressed in Section 3.3.3.

Belding's Savannah Sparrow

Belding's Savannah sparrow forages and nests in the salt marsh vegetation supported within the Palomar channel that extends along the eastern edge of Pond 15, and also along the salt pond levee within salt marsh vegetation within Pond 15. Belding's Savannah sparrow territories have also been documented throughout the South Bay Salt Works where appropriate habitat is present. Nesting locations from 2015 are shown in Figure 3.3-1~~6~~7.

East Pacific Green Turtle

East Pacific green turtle was listed as endangered throughout its range (NMFS and USFWS 1998; USFWS 2007b) until April 6, 2016, when the Service and the National Oceanic and Atmospheric Administration issued a final listing rule for 11 Distinct Population Segments (DPS) of green sea turtle. As a result of analysis conducted prior to issuing this Final Rule, the East Pacific DPS is now listed as threatened under the Federal Endangered Species Act (81 FR 20057).

In the past, this regionally important population has exhibited an extreme decline in population as a result of severe overharvest of wintering turtles in the Sea of Cortez between 1950 and 1970, intense collection of eggs between 1960 and early 1980 on mainland beaches of Mexico, nesting habitat destruction, and incidental capture in commercial fisheries. However, recent conservation efforts have led to increasing abundance at numerous nesting sites throughout the range of the East Pacific DPS. In addition to the increasing trends at Michoacán, stable to slightly increasing nesting trends have been observed at Galápagos nesting beaches, which host the second largest nesting aggregation of the East Pacific DPS (81 FR 20057). Presently, the East Pacific DPS is not considered in danger of extinction; however, it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range due to habitat loss and degradation, overexploitation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, boat strikes, red tide poisoning, and climate change. For these reasons, the East Pacific DPS is now considered a ~~Federally~~federally listed threatened species (81 FR 20057).

Although they do not nest as far north as the California coast, the East Pacific DPS of green sea turtles are often found during the summer in waters off the coast of California, Oregon, and sometimes as far north as Alaska (Southwest Fisheries Science Center 2007). Adults feed almost exclusively on sea grasses (e.g., eelgrass) and marine algae that is abundant in these areas. Stinson (1984) reviewed sea turtle sighting records from northern Baja California to Alaska and determined that the East Pacific DPS was the most commonly observed hard-shelled sea turtle on the U.S. Pacific Coast. Most of the sightings (62%) were reported from northern Baja California and Southern California. As of 2006, the northernmost reported resident (nonbreeding) population occurred in the San Diego Bay.

Although there is a consistent population of turtles that reside in the San Diego Bay, these turtles have been documented as migrating in and out of the Bay at different times. Researchers believe that these individuals return to this location due to the abundance of eelgrass available in San Diego Bay, as well as the relief from predation and poaching that the Bay provides (USFWS 2006a). Turtles have been observed in the open waters of San Diego Bay to the north of Pond 15.

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3.4 CULTURAL RESOURCES

This section describes the cultural resources present within the project site from a regional context and at the site-specific level for the Otay River Estuary Restoration Project. A more detailed description of the cultural resources and archaeological setting in and around the south end of San Diego Bay is presented in the Final Comprehensive Conservation Plan/Environmental Impact Statement (EIS) for the San Diego Bay National Wildlife Refuge (NWR) (USFWS 2006), which is incorporated by reference into this document.

The information presented here is based on research and fieldwork conducted by Dudek (Comeau et al. 2016; Hale and Giacinto 2012) for the U.S. Fish and Wildlife Service, attached as Confidential Appendix K to this EIS, and several prior investigations conducted in the general area (ASM 1987; Cook and Andrews 2003; Gustafson and Gregory 2001; Laguna Mountain Environmental 2009; Laylander 1993). The proposed action's area of potential effect includes all areas where disturbance related to the proposed action (e.g., grading, filling, truck access, general construction activities) would occur.

3.4.1 Cultural Context

No single classification has been agreed upon for the different periods of prehistory and history. Over time, researchers have used different terms to describe what they view as distinct periods in the overall cultural context of San Diego County, but the cultural background of San Diego County continues to evolve as new information becomes available. In consultation with the Kumeyaay Nation, they provide an alternate view and do not "recognize the separation of time into archaic, prehistoric, and historic," but rather view the Kumeyaay Nation's cultural context as a continuum in which the Kumeyaay "people have been here since time began."

Native American History

The earliest recognized period of California prehistory is referred to as Paleo-Indian. In the San Diego region, this period is usually considered to date from at least 10,000 years before present until 8,500 to 7,200 years before present. The sites that have been documented from this period are identified as belonging to the San Dieguito Complex. Flaked stone tools, such as knives, blades, and scrapers, suggest a hunter-gatherer society, and the apparent absence of milling implements and ceramics from these sites suggests little or no use of seed-grinding technology (Appendix K, Confidential).

The Archaic period began at least 7,200 years ago, possibly as early as 9,000 years before present, and lasted until about 2,000 years ago. Sites from this time are identified by some as belonging to the La Jolla Complex. This cultural tradition appears to have two distinct subdivisions in Southern California. The first, found along the coastal areas of Southern

California, had an economy that relied largely on gathering wild resources, such as shellfish and seeds, along the coast; farther inland, hunting and gathering techniques were replaced with horticultural and agricultural techniques. During this phase, a reliance on seed and nut resources is suggested by the presence of grinding implements such as manos and metates. Coastal sites from this period are frequently characterized by shell midden and fire hearths (Appendix K, Confidential).

The Late Archaic, also referred to as the Late Prehistoric Period, is defined as approximately 2,000 years before present to Spanish contact (1769). This period is represented by the Yuman-speaking people from the Colorado River region who migrated into what is now Southern California. This period is recognized archaeologically by small pressure-flaked projectile points and the use of mortars and pestles for grinding seeds and acorns. Archaeological evidence indicates that the manufacture and use of ceramic vessels for cooking, storage, and other uses began about 1,000 years ago (Appendix K, Confidential).

At the time of European contact, a fairly large, stable population of Kumeyaay people occupied the region of what is now Southern California; they were direct descendants of the early Yuman hunter-gathers of the Late Archaic period. The Kumeyaay people lived in small groups within territories where they claimed minor plant resources and eagle aeries. Acorns were an important food source for the Kumeyaay, along with upland game in the hills and fish and shellfish in coastal areas. The Kumeyaay also practiced resource management and were proficient in many plant propagation methods. According to Kumeyaay Elder Delfina Cuero, as described in her autobiography (Cuero and Shipek 1991), local Native Americans also gathered salt near the southern end of San Diego Bay for cooking and preserving fish and as a trade good for other tribes.

~~Displacement~~ Disruption of Kumeyaay culture and society began at European contact. The introduction and development of the Mission system, and later the establishment of ranchos under the Mexican land grant program, all contributed to the ~~disruption and~~ break~~-~~down of the Kumeyaay cultural institutions that existed during that time (USFWS 2006). However, the Kumeyaay culture has persisted and today has a strong presence within the region.

Early Euro-American History

The first recorded exploration of what is now known as San Diego Bay was conducted in 1542 by Portuguese explorer Juan Rodriguez Cabrillo, sailing under the Spanish flag. Sixty years later in 1602, Sebastian Vizcaino sailed into what is now known as San Diego Bay. It was not until 1769, however, that an overland party of missionaries, traveling north from Baja California, began the exploration and settlement of the region. This period, which extended from 1769 to 1821, is referred to as the Spanish Period. It is during this time that the San Diego Presidio and San Diego and San Luis Rey Missions were established (Appendix K, Confidential).

In the 1770s, the land now included within the San Diego Bay NWR boundaries was part of La Purisima Concepcion, a grazing area for Mission herds. In 1795, the area was taken from the Mission by soldiers at the San Diego Presidio and renamed El Rancho del Rey. The land was then used to graze the horses and cattle for the presidio garrison (Appendix K, Confidential).

San Diego Bay was first mapped by Juan Pantoja in 1782 during a 7-week layover in the area. On his map, entitled “Plano del Puerto De S. Diego,” the project site is located along the eastern edge of the marshy floodplain, at the southeastern extent of San Diego Bay in the vicinity of Rancheria de La Punta. However, the map is highly generalized. Pantoja likely dedicated the majority of his attention to determining the depths of the bay and the river inlets. It appears likely that the project site is located south of “Est de agua salada” (salt water estuary) and north of “R[io] y Ranc[heria] de La Punta” (River and Ranch of La Punta). This indicates that the two northwest-trending drainages may be the Otay River to the north and Nestor Creek to the south. The Ranch of La Punta, presumably a native Kumeyaay village, is represented on Pantoja’s 1782 map. The villages of Melijo and La Punta were both referenced in historical records, notably by Lt. Francisco Ortega, who listed them as two of 15 Native American villages that contributed members to the San Diego Mission uprising of 1775 (Carrico 1983). Ortega conducted a thorough investigation of the Village of La Punta, known as a Christian village, and Melijo following the uprising. In this way, the presence of the Kumeyaay village of La Punta in this area has been substantiated by a number of ethnographic sources; however, the discrete location of this habitation area, if in fact it was associated with a specific place, was lost over time (Appendix K, Confidential).

In 1821, control of California passed from Spain to Mexico. This period, referred to as the Mexican Period, extended to 1848, when Mexico ceded California to the United States after the Mexican–American War of 1846–1848. Following Mexico’s independence from Spain, the missions were secularized and the large missions were divided and granted to individuals and families loyal to Mexico. This process became known as the rancho system of land distribution (Appendix K, Confidential).

In 1848, Mexico ceded California to the United States, and under the provisions of the Treaty of Guadalupe Hidalgo, residents of California were guaranteed property rights to land held in accordance with Mexican law. Acquiring title to these lands, however, was difficult. In 1851, the U.S. Congress established procedures that would assist individuals in gaining clear title (a “patent”) to these lands. In 1866, U.S. President Andrew Johnson granted a land patent for the El Rancho de la Nacion (listed as National Ranch), and on June 15, 1868, the Kimball brothers purchased the National Ranch for $30,000. This land patent included 6 miles of bayfront in the vicinity of what is now National City (Appendix K, Confidential).

Development of National City began slowly. In 1869, many individuals came to National City in hopes of working for the Memphis and El Paso Railroad, a project that did not materialize as promised. Between 1869 and 1873, the road connecting National City to the border was improved, a post office was established, and a wharf was constructed along the bayfront. Following a financial crash in 1873, which ended the current hopes for a railroad boom, the Kimball brothers turned to agriculture. Much of the area was used to raise sheep; grow wheat; and cultivate oranges, lemons, grapes, and olives (Appendix K, Confidential).

In 1885, the vision of a railroad line connecting National City to other parts of California and beyond was realized with the completion of a line that connected National City to San Bernardino. This was followed by the incorporation of National City in 1887. During that same year, the San Diego Land and Town Company, the syndicate controlled by the Santa Fe Railroad, began construction of the Sweetwater Dam to promote land sales in National City and Chula Vista. Early in its history, Chula Vista was an agricultural center, known for its flowers, citrus, and celery. Later, Chula Vista became a residential and industrial area, and a center for aircraft parts manufacturing. The Coronado Belt Line was completed in 1888. This railroad provided service from 5th and L Streets in San Diego, through National City and Chula Vista around the south end of the San Diego Bay, and up the Silver Strand to Coronado. The railroad, which was originally owned by Elisha S. Babcock, Jr., H.L. Story, and associates, was built as part of the Coronado Beach development. The railroad was used to transport freight and passengers to and from Coronado. Regular passenger service on this line ended in 1896, but special excursion trains continued to operate for several years thereafter. In addition to the community and agricultural development occurring in the mid to late 1800s in the vicinity of the area now included within the San Diego Bay NWR Sweetwater Marsh Unit, agricultural and industrial development was also occurring in and around lands and waters now included in the South San Diego Bay Unit (Appendix K, Confidential).

The history of solar salt production in the South Bay began in 1871 with development of La Punta Salt Works. This small-scale salt production facility was initially constructed on approximately 60 acres in the extreme southeast corner of San Diego Bay. This facility subsequently closed, and in 1902, Graham Babcock established the Western Salt Company approximately 0.25 mile northeast of the extant La Punta Salt Works. In 1911, when E.S. Babcock took over the Western Salt Company operation, he began purchasing much of the land along the south end of San Diego Bay to expand the facility. As the facility expanded, the historic salt marsh and intertidal mudflats were eliminated by the formation of diked evaporation ponds. By 1916, the facility extended across the entire end of the South Bay. A major flood severely damaged the facility in early 1916, but reconstruction began immediately and continued through 1918 (Appendix K, Confidential).

In 1922, the salt works facility was purchased by H.G. Fenton and remained under the ownership of H.G. Fenton Company until the majority of the salt works was incorporated into the South San Diego Bay Unit in 1999. The southeastern-most bittern ponds, which were not included in the San Diego Bay NWR acquisition boundary, were retained by H.G. Fenton Company until the land was sold to the Charles Company. The salt ponds included within the San Diego Bay NWR, now operated by South Bay Salt Works, continue to produce salt through solar evaporation under a Special Use Permit issued by the U.S. Fish and Wildlife Service. In 2011, the salt production operation was downsized when the western salt ponds were taken out of operation and restored to tidally influenced coastal wetlands (Appendix K, Confidential).

Until 1986, the portion of the Otay River floodplain previously known as the MKEG/Fenton area was primarily used for the production of truck crops. The 146-acre parcel, located to the south of the salt works facility, included the 126-acre MKEG property owned by the Egger and Ghio Corporation and a 20-acre Fenton parcel purchased by the City of San Diego in the late 1990s (USFWS 2006). The area currently consists of a combination of fallow agricultural land that is regularly disked to control weed growth and restored riparian habitat located to the east and west of the Otay River channel. To the west of Nestor Creek, the project site includes approximately 33.5 acres of Otay River floodplain. This area encompasses the northern one-third of what was previously referred to as Pond 20. Pond 20 was at one time part of the evaporative salt pond system operated by the Western Salt Company.

3.4.2 Regulatory Context

Federal Regulations

Requirements for federal agencies to identify, evaluate, and protect cultural resources are outlined in several federal regulations, including the National Historic Preservation Act of 1966 (NHPA), the Antiquities Act of 1906, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990.

The NHPA (16 U.S.C. 470 et seq.) establishes the nation's policy for historic preservation and sets in place a program for the preservation of historic properties by requiring federal agencies to consider effects to significant cultural resources (e.g., historic properties) prior to undertakings. The NHPA established the National Register of Historic Places (NRHP) and the President's Advisory Council on Historic Preservation, and provided that states may establish State Historic Preservation Offices to carry out some of the functions of the NHPA. Most significantly for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that "[t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP." Section 106 also affords the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

Title 36, Part 800 of the Code of Federal Regulations implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether they may be adversely affected by a proposed undertaking; and to outline the process for eliminating, reducing, or mitigating adverse effects.

The content of Title 36, Part 60.4 of the Code of Federal Regulations defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historical significance in consultation with the State Historic Preservation Officer to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if they possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or
B. Are associated with the lives of persons significant in our past; or
C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. Have yielded or may be likely to yield, information important in prehistory or history (36 CFR, Part 60.4).

The Antiquities Act of 1906 authorizes the scientific investigation of antiquities on federal land, prohibits and provides penalties for unauthorized search for or collection of artifacts or other objects of scientific interest, and authorizes the U.S. president to establish national monuments and cultural areas on federal lands. The Archaeological Resources Protection Act protects archaeological resources on public lands. The Native American Graves Protection and Repatriation Act requires federal agencies to provide information about Native American cultural items (e.g., human remains, funerary objects, sacred objects, and objects of cultural patrimony) to parties with standing, such as lineal descendants or culturally affiliated Native American tribes, and, upon presentation of a valid request, dispose of or repatriate these objects to them.

State Regulations

California Register of Historical Resources

The California Office of Historic Preservation maintains the California Register of Historical Resources (CRHR). The CRHR is the authoritative guide to the state's significant historic and archaeological resources. The program provides for the identification, evaluation, registration, and protection of California's historic resources. The CRHR encourages public recognition and protection of resources of architectural, historic, archaeological, and cultural significance; identifies historic resources for state and local planning purposes; and determines eligibility for state historic preservation grant funding.

The CRHR has four criteria to be used when evaluating the eligibility of a property or resource for listing:

- It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
- It is associated with the lives of persons important to local, California, or national history.
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.
- It has yielded, or is likely to yield, information important to prehistory or history of the local area, California, or the nation.

Similar to the NRHP, eligibility for the CRHR requires establishment of physical integrity, including the seven aspects previously described. The CRHR's list of special considerations is less stringent than the NRHP's, providing allowances for relocated buildings, structures, or objects, and reduced requirements for physical integrity.

Native American Historic Cultural Sites (California Public Resources Code, Section 5097 et seq.)

State law addresses the disposition of Native American burials in archaeological sites, and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction projects; and establishes the Native American Heritage Commission to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy a Native American historic or cultural site that is listed or may be eligible for listing in the CRHR.

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act, enacted in 2001, required all state agencies and museums that receive state funding and that have possession or control over collections of human remains or cultural items, as defined, to complete an inventory and summary of these remains and items on or before January 1, 2003, with certain exceptions. The act also provides a process for the identification and repatriation of these items to the appropriate tribes.

California Health and Safety Code, Section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. Section 7050.5 of the California Health and Safety Code requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains can occur until the county coroner has examined the remains (Section 7050.5b). If the coroner determines or has reason to believe that the remains are those of a Native American, the coroner must contact the Native American Heritage Commission within 24 hours (Section 7050.5c). The Native American Heritage Commission will notify the most likely descendant. With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 24 hours of notification of the most likely descendant by the Native American Heritage Commission. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

3.4.3 Cultural Resources in the Vicinity of the Project Site

Cultural resources investigations for the proposed action included a records search, pedestrian surveys, geotechnical monitoring, and significance evaluations. A records search was completed for the project site and a 0.25-mile radius around the project site ("study area") in April 2012 in support of archaeological monitoring of geotechnical soil sampling completed shortly thereafter. An intensive pedestrian survey was completed in August 2012, confirming the location and condition of resources identified in the records search, and subsequently recording two new prehistoric archaeological resources. Six cultural resources have been recorded within the study area. Table 3.4-1 outlines these resources and their NRHP eligibility.

Table 3.4-1
NRHP Eligibility Status for Cultural Resources in the Study Area

Resource	Description	Evaluated?	NRHP Eligibility
Prehistoric Archaeological Resources			
CA-SDI-7455	Prehistoric habitation, likely association with ethnohistoric Village of La Punta recorded by Spanish in 1872	Yes	Recommended eligible, Criteria A and D
CA-SDI-19,712	Prehistoric habitation	Yes	Recommended not eligible
CA-SDI-20,686	Prehistoric artifact scatter	Yes	Recommended not eligible
CA-SDI-20,765	Prehistoric artifact scatter	Yes	Recommended not eligible
Historic Period Resource			
P-37-026582	Western Salt Company Salt Works	Yes*	Recommended eligible, Criteria A and C
SDI-13,073	Coronado Belt Line Railroad	Yes*	Recommended not eligible

Sources: Comeau et al. 2014; *Gustafson and Gregory 2001.

CA-SDI-7455

This large scatter of prehistoric artifacts and ecofacts was first recorded by University of Southern California archaeologists in 1961. The resource was revisited by ASM Affiliates in 1987, when a number of areas containing scattered shell and artifacts were observed. The area was noted to have been substantially disturbed by agricultural activities and construction of Interstate 5. During monitoring activities conducted for a City of San Diego Metropolitan Wastewater Department project, stratified cultural deposits were encountered during trenching (Cook and Andrews 2003). It was determined that the cultural material was most likely related to the previously recorded resource, SDI-7455. A hollow-stem auger coring plan was implemented to map the subsurface distribution of archaeological deposits as a form of data recovery. The coring program indicated that cultural material decreased in density on a south-to-north gradient.

Dudek identified an extension of SDI-7455 during geotechnical coring conducted for the proposed action (Comeau et al. 2014). The investigation revealed a moderately sized and diverse assemblage of artifacts dominated by a marine shell midden, with the remainder of the assemblage consisting of flaked stone, groundstone, percussing tools, ceramics, fire-affected rock, and vertebrate faunal remains. Aside from flaked lithic debitage, other artifacts included flaked stone tools, groundstone tools, ceramic brownware sherds, fire-affected rock, and faunal bone. No human remains were recovered from SDI-7455. Five radiocarbon dates (four marine shell samples and one charcoal sample) yielded relatively consistent dates, all post-dating AD 1520. This age is consistent with those obtained for the Late Prehistoric deposit identified by Cook and Andrews (2003) for SDI-7455 deposits to the east. These dates also overlap with the Spanish observation of Native Americans inhabiting the general area in AD 1782. Dudek's study indicated that the deposits identified at SDI-7455 could be related to the ethnohistoric village of

La Punta identified in 1782, and, as such, these deposits are recommended as eligible for listing in the NRHP under Criteria A (significant historical events) and D (scientific data potential).

CA-SDI-19,712

CA-SDI-19,712 was first recorded by Laguna Mountain Environmental in 2009 as a small prehistoric artifact scatter. An additional scatter of artifacts was recorded as a new prehistoric resource, CA-SDI-20,687, during geotechnical monitoring. SDI-19,712 and SDI-20,687 were eventually combined into a single resource (labeled SDI-19,872) due to an overlap of cultural material.

During geotechnical exploration and archaeological testing at SDI-19,712, pieces of debitage, groundstone tools, and ceramics were found. In addition, four human bone fragments were identified, which triggered implementation and resolution of inadvertent discovery procedures in accordance with the Native American Graves Protection and Repatriation Act. The Kumeyaay Cultural Repatriation Committee was determined to be the Most Likely Descendant for treatment of human remains. Following discussions between the Kumeyaay Cultural Repatriation Committee and the U.S. Fish and Wildlife Service, the remains were repatriated to the Kumeyaay Cultural Repatriation Committee on July 24, 2013 (USFWS 2013).

All four bone fragments were recovered from the very loose, pale brown soil within the upper 100 centimeters (39 inches) of the site. As is to be expected in or along a river channel, artifacts found in this area are those accumulated through deposition of swiftly moving sediment. Additionally, given the extensive historic use of the area for solar salt production, repeated grading, agricultural use, and other earthmoving activities have likely deposited and redeposited material throughout the site and surrounding area. Therefore, the assemblage of artifacts found at SDI-19,712 lacks contextual integrity and cannot offer an interpretation of specific past activities at the site. The assemblage is, therefore, viewed in a regional context as a sample of the artifact types present in Otay River Valley in general. Cultural deposits identified at SDI-19,712 do not meet any of the significance criteria for listing under the NRHP. The site is recommended as not eligible.

SDI-20,686

SDI-20,686 was originally recorded in May 2012 during archaeological monitoring of geotechnical soil sampling as a small lithic scatter. The general resource boundaries were expanded to better encompass the relatively sparse distribution of marine shell and other prehistoric cultural material, recognizing that the boundary is artificial, given the history of grading in the area. Extensive ground disturbance is evidenced by a large number of machine-fractured cobbles, and pieces of concrete, asphalt, and historical period bottle glass that were observed within and west of the resource area.

During the recent Dudek investigation of SDI-20,686, no significant buried deposits were identified. The surface scatter of artifacts is interpreted as a product of past land modifications rather than having been deposited there during Native American habitation. As such, SDI-20,686 is considered not eligible for NRHP listing under any of the NRHP significance criteria.

SDI-20,765

SDI-20,765 was first recorded during Dudek's survey as a small scatter of prehistoric artifacts. The resource was revisited by Dudek during the evaluation of SDI-7455 and SDI-20,686, and all artifacts were collected. However, the artifacts were found situated near and on top of chunks of asphalt and concrete. It was subsequently determined that no primary archaeological deposits existed in the vicinity based on the assumption that the artifacts were deposited there during modern times. As such, the resource is considered not eligible for NRHP listing under any of the significance criteria.

SDI-13,073

SDI-13,073, the Coronado Belt Line Railroad, was first recorded and evaluated by Laylander in 1993. Further evaluation of the resource occurred in 1994 (King 1994, cited in Tierra Environmental Services 2001). The site was subsequently determined not to be eligible for the NRHP by the California State Historic Preservation Officer (Widell 1994, cited in Tierra Environmental Services 2001). The resource consists of a 7.5-mile-long portion of the railroad ties, trestle bridges, railroad grade, and tracks, which are still extant. The resource was recommended as not eligible for the NRHP, and the State Historic Preservation Officer concurred with this recommendation in 1994. In 2003, the City of San Diego designated the resource as Historic Landmark Site No. 640, finding it to be a local historic resource under the City of San Diego's Historic Resource Board Criteria A, B, and C. Following an appeals process, in 2005, the City Council upheld the historic designation of the 1.5-mile portion of the railroad located within the San Diego (Appendix K, Confidential). During the current investigation, no additional recordation or research was performed related to this resource since it has been fully documented in previous studies.

P-37-026582

The Western Salt Company Salt Works facilities (P-37-026582) were first recorded and evaluated for NRHP eligibility by Gustafson and Gregory (2001). This historic period resource was recommend as significant under Criterion A of the NRHP because it played an important role in the solar salt industry in Southern California from 1916 through the 20th century, even though it began operating in 1871 (Gustafson and Gregory 2001). It was also recommended eligible for NRHP listing under Criterion C since it was interpreted to embody the distinctive characteristics of a solar salt processing facility of the era, being the only one of its kind in San Diego County (minor solar salt farms were present in Carlsbad and La Costa, northern San Diego County, in the early 1900s). The resource is extensive; during the period of operation, it covered much of the southern edge of San Diego Bay. The Western Salt Company Salt Works was found eligible by the State Historic Preservation Officer as a historic district under both Criteria A and C, as defined by 36 CFR 60.4, in 2002. The salt ponds and their associated levees, berms, and tidal gates were defined as some of the contributing elements of the district (Appendices K1 and K2).

Dudek conducted additional archival and field research on this resource, paying particular attention to those salt ponds located within the project site. The goal of the additional research was to prepare updated resource records and condition assessments of this historic period resource. Most recently, Dudek revisited the levees that separate the salt ponds in October 2013. Dudek confirmed the essential elements of the salt works district noted in previous research to determine whether any significant changes to the resource have occurred. Dudek completed an update to the original Department of Parks and Recreation site form for this resource, essentially confirming the condition of the resource as it was last recorded, and the recommendation that the levees are eligible for listing in the NRHP as contributing elements to a district under Criterion A for playing a significant role in the solar salt industry from 1916 to 1949, and Criterion C because it embodies the distinctive characteristics of a solar salt processing facility. In addition, Dudek found that the levees appear to retain integrity of location, setting, design, materials, workmanship, feeling, and association.

3.5 SOCIAL AND ECONOMIC ENVIRONMENT

3.5.1 Land Use

This section provides information regarding land use both on the project site and in the general vicinity of the project site for the Otay River Estuary Restoration Project (proposed action). Overlapping regional land uses and land use policies that affect land use in the immediate vicinity are also discussed. The project site is located in the southeastern portion of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (NWR). The U.S. Fish and Wildlife Service (Service) manages the San Diego Bay NWR consistent with applicable federal laws and regulations and in accordance with the guidance provided in the *San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan* (CCP; USFWS 2006). The approximately 165.3-acre project site includes two separate non-contiguous sites: the Otay River Floodplain Site and the Pond 15 Site, as shown in Figure 1-2, Vicinity Map, in Chapter 1. Outside of the two defined sites, there are several project features associated with the proposed action, outlined in detail within Section 2.3.2 of this Environmental Impact Statement (EIS) and shown in Figure 2-1a in Chapter 2.

Five city boundaries extend into the south end of San Diego Bay: San Diego, Chula Vista, National City, Imperial Beach, and Coronado. The Otay River Floodplain Site is located within the jurisdictional boundaries of the City of San Diego, and the Pond 15 Site is located within the boundaries of the City of National City. The majority of the lands within the area of potential effects for the proposed action are sovereign lands held by the California State Lands Commission for the benefit of the people of California and leased to the Service for management as a wildlife refuge. On June 16, 1999, the California State Lands Commission leased 2,209 acres at the south end of San Diego Bay, including areas within the Otay River Floodplain Site and the Pond 15 Site, to the Service for 49 years with an automatic extension to 66 years (California State Lands Commission 1999).

Executive Order 12372, Intergovernmental Review of Federal Programs, requires federal agencies to provide opportunities for consultation to state and local governments that would be directly affected by a federal action. Although the project site is located within the cities of National City and San Diego, the area is managed by the Service as a part of the San Diego Bay NWR, and activities proposed on lands within the San Diego Bay NWR do not require permits or approvals from these local jurisdictions. However, coordination and consultation among the Service; local, state, and federal agencies; and tribes are ongoing.

Otay River Floodplain Site

The Otay River Floodplain Site encompasses 33.51 acres of the Otay River floodplain. The proposed action would also include approximately 40.9 acres of project features associated with implementation of the restoration efforts. Historically, the area in which the Otay River Floodplain Site is located was composed of intertidal mudflats and salt marsh, but was filled to allow agricultural use and to expand salt production. Currently, the uses within the floodplain are limited to open space and wildlife habitat.

The CCP for the San Diego Bay NWR (USFWS 2006) proposes that the lands within the Otay River Floodplain Site be restored to native wetland and upland habitats. No public access is permitted within this portion of the San Diego Bay NWR, but public access is permitted farther to the east along the City of San Diego bike path that extends south from Main Street to Palm Avenue and along the Otay River Valley Regional Trail that enters the San Diego Bay NWR from under the Otay River/Interstate 5 (I-5) bridge and then extends northeast through a corner of the San Diego Bay NWR to Main Street.

Prior to San Diego Bay NWR establishment, the Otay River Floodplain Site was designated in the City of San Diego's General Plan as "Park, Open Space, and Recreation," as shown in Figure LU-2 of the City of San Diego's General Plan (City of San Diego 2008), and designated as "Open Space – Special Study Area" by the Otay Mesa–Nestor Community Plan (City of San Diego 1997a). The Special Study Area, which includes other properties adjacent to the San Diego Bay NWR, is intended to ensure that the area maintains its current use or is restored and managed as a natural resource area or regional recreation area, or as part of the salt production industry (City of San Diego 1997a). Although these designations do not apply to the San Diego Bay NWR lands, the uses proposed in the CCP are consistent with the City of San Diego's previous designations for this area.

All of the land immediately adjacent to the Otay River Floodplain Site is included within the San Diego Bay NWR with the exception of the area directly south of the project site. Of these areas south of the project site, those lands located to the east of Nestor Creek are regulated by the City of San Diego, and the 95-acre parcel (referred to as Pond 20) located immediately south of the Otay River Floodplain Site and west of Nestor Creek is owned, managed, and controlled by the Port of San Diego (Port). In July 2015, the Board of Port Commissioners approved a plan for Pond 20 that calls for the establishment of an 84-acre wetlands mitigation bank, a 3.1-acre commercial parcel on the western edge of Pond 20 that could be developed to complement the new Bikeway Village project under development in the City of Imperial Beach, and a 7.9-acre area on the eastern edge of the parcel that could be developed with low-intensity commercial uses. In October 2015, the Port issued a Request for Proposals seeking qualified consultants and/or developers to establish and operate an 84-acre wetlands mitigation bank in Pond 20. Plans for the development of the two smaller areas will be addressed at a later date (Port 2015).

The lands located to the south of the Otay River Floodplain Site and east of Nestor Creek are designated as "Park, Open Space, and Recreation" in the City of San Diego General Plan (City of San Diego 2008). Within the Otay Mesa–Nestor Community Plan, the parcels are designated as "Open Space" and are located within the Special Study Area described above. The parcels are zoned as OF-1-1 (Open Space – Floodplain). Approximately 0.16 mile south of the open space is an area of residential development that has a General Plan land use designation of "Residential," but is zoned "IL-3-1," which allows for a mix of light industrial, office, and commercial uses (City of San Diego 2008, 1997a, 2013a). Refer to Figure 3.5-1, Surrounding Land Uses in the Project Vicinity, for a visual representation of the land use designations surrounding the project site.

The area east of the Otay River Floodplain Site (between the Otay River Floodplain Site and I-5) is also part of the San Diego Bay NWR, although the City of San Diego retains ownership of narrow strips of land that were dedicated to the City of San Diego for future public streets in association with a subdivision map for the area that was never implemented. The area surrounding these dedicated lands are located within the San Diego Bay NWR, and the City of San Diego retains ownership of the "paper streets." There are also numerous utility easements in this area (see Section 3.5.3).

Directly adjacent to the southeastern edge of the San Diego Bay NWR is the Otay Valley Regional Park, which extends approximately 13 miles inland to Upper and Lower Otay Lakes. This area protects wildlife and historical, agricultural, and archaeological resources while providing recreational playing fields and picnic areas. A trail from this area goes through the San Diego Bay NWR to provide a connection to the main Otay Valley Regional Trail that extends to the east, and to provide a connection from the east and south to the Bayshore Bikeway, a regional bicycle facility that, when completed, will extend for 24 miles around San Diego Bay.

As shown in Figure 3.5-1, the Otay River follows the north and northwestern Otay River Floodplain Site boundary. A portion of the Bayshore Bikeway provides public access along the northern edge of the Otay River Floodplain Site as it travels along a San Diego Metropolitan Transit System right-of-way located outside of the boundaries of the San Diego Bay NWR. Farther to the north, within the San Diego Bay NWR boundary, are active solar salt ponds associated with South Bay Salt Works.

To the west and southwest of the Otay River Floodplain Site are properties located within the City of Imperial Beach. These areas include residential development consistent with the City of Imperial Beach General Plan and R-3000-D zoning, which permit two-family detached residential uses (City of Imperial Beach 2010) and mixed-use development associated with the City of Imperial Beach's Bikeway Village project. Another area of multi-family residential development is located on the northeast corner of 13th Street and Palm Avenue. This area is included within the City of San Diego's Otay Mesa–Nestor community. Both residential areas have the potential to be affected by construction activities associated with implementation of the proposed action.

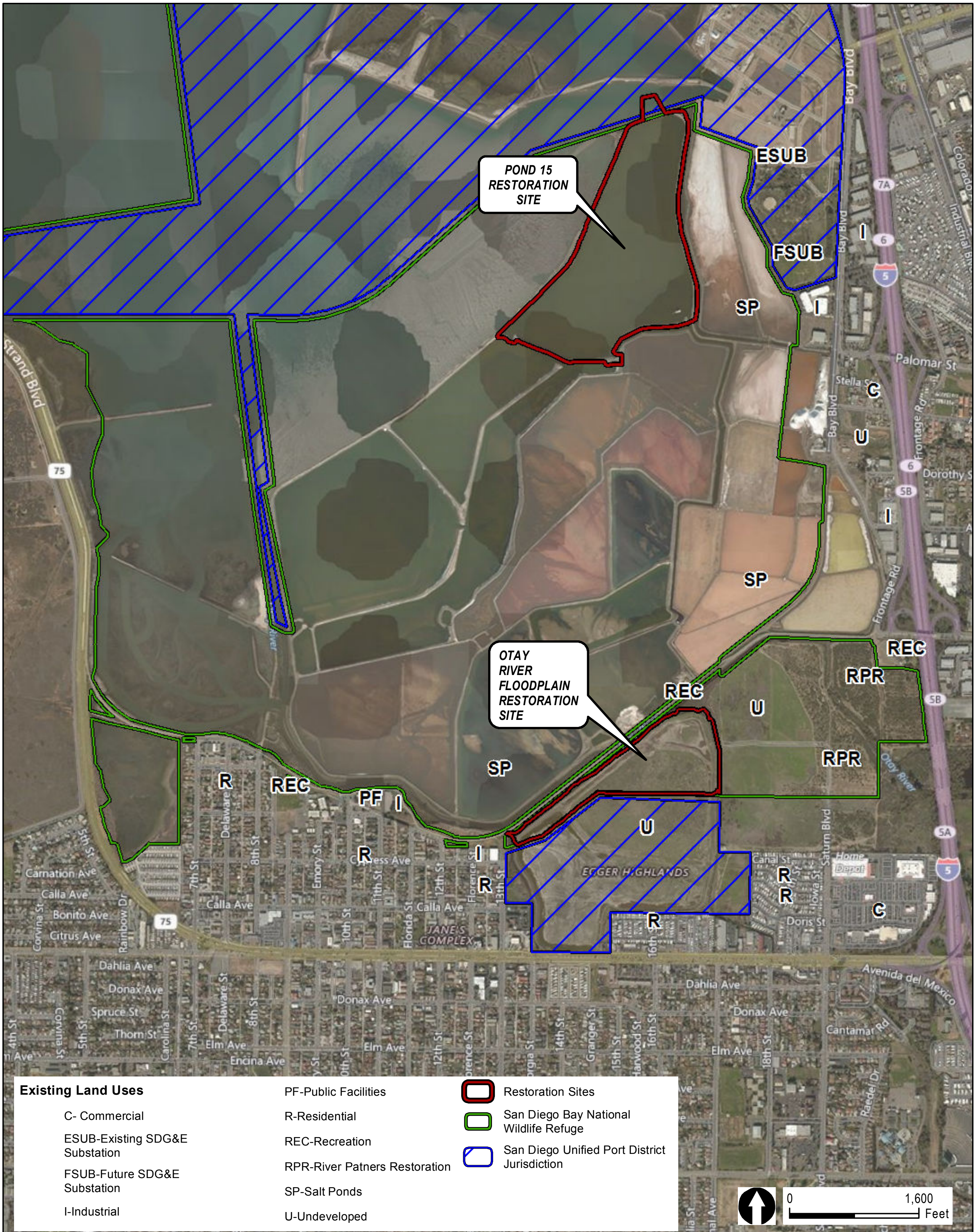
Pond 15 Site

The majority of the approximately 90.90-acre Pond 15 Site is included in the San Diego Bay NWR. A 1.3-acre area to the north of the outer levee, where breaching of the levee is proposed to accommodate tidal exchange within the restored pond, is managed by the Port. Pond 15 is an active salt pond within the South Bay Salt Works that operates within the San Diego Bay NWR under a Special Use Permit. South Bay Salt Works currently uses approximately 830 acres of the San Diego Bay NWR for producing salt through a solar evaporation process. This includes approximately 300 acres of primary ponds (Ponds 12–15), 360 acres of secondary ponds (Ponds 20–27), and 170 acres of ponds used in the pickling and crystallizing process (Ponds 28–30 and 41–48). Outside of the San Diego Bay NWR, the South Bay Salt Works includes Pond 40, which is owned by the Friends of the San Diego Wildlife Refuges, and Ponds 50–54, which are leased from a private landowner for harvesting salt and capturing magnesium chloride, the last product produced in the solar evaporation process (Yuen, pers. comm. 2014a). Public access to all areas associated with active salt production, including the Pond 15 Site, is limited. The CCP proposes that the Pond 15 Site be restored to coastal wetland with an area set aside for seabird nesting (USFWS 2006).

The Pond 15 Site is bound by lands within the cities of Chula Vista, National City, and San Diego. On the western perimeter of the Pond 15 Site are Ponds 13 and 14, to the south are Ponds 24 and 25, and to the east is Pond 28, all part of the existing solar salt operation, as shown in Figure 1-2 in Chapter 1.

Directly north of the Pond 15 Site are areas managed by the Port, including the open water in San Diego Bay. The Port Master Plan (San Diego Unified Port District 2015) includes this area within the Chula Vista Bayfront Precise Plan and identifies a portion of the Bay immediately north of Pond 15 as wetlands. Farther north is a gated dirt road used by the Port for maintenance and management access to the 55-acre Chula Vista Wildlife Reserve.

The land directly northeast of the Pond 15 Site is within the jurisdiction of the City of Chula Vista, governed by the City of Chula Vista's General Plan and Local Coastal Plan, and the City of Chula Vista Redevelopment and Housing Authority. The Chula Vista General Plan defers to the Port Master Plan (City of Chula Vista 2005), which defines the area within Planning District 7 or the Chula Vista Bayfront (refer to Figure 3.5-1).



AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 3.5-1

Surrounding Land Uses in the Project Vicinity

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The lands adjacent to the northeast edge of the Pond 15 Site and to the east of Ponds 28 and 29 along the west side of Bay Boulevard are included within the Otay District (Planning Subarea 76) of the Port Master Plan. The Port Master Plan proposes moderate-intensity mixed-use development, including industrial and low-cost visitor-serving recreational uses, within the Otay District (Port 2012). In addition, San Diego Gas & Electric is in the process of relocating its South Bay Substation to the southernmost end of the Otay District. Farther to the east, between Bay Boulevard and I-5, the properties have been developed with a mix of industrial, residential, and commercial uses.

Construction access to the Pond 15 Site would involve providing a temporary road along an existing Service access easement located to the north of the intersection of Palomar Street and Bay Boulevard. The temporary road would extend west from Bay Boulevard and then turn south along the eastern edge of Pond 29, as shown in Figure 2-1a of Chapter 2.

Regional Habitat Conservation Planning

The San Diego Multiple Species Conservation Program (MSCP) is a comprehensive, long-term habitat conservation planning program that covers approximately 900 square miles (582,243 acres) in southwestern San Diego County pursuant to the federal and California Endangered Species Acts and the California Natural Community Conservation Planning Act. It was developed cooperatively by participating jurisdictions/special districts in partnership with the Service, the California Department of Fish and Wildlife, property owners, and representatives of the development industry and environmental groups. The MSCP is designed to preserve native habitat for multiple species rather than focusing efforts on one species at a time. This is accomplished by identifying areas for directed development and areas to be conserved in perpetuity (referred to as a Multi-Habitat Planning Area (MHPA)) to achieve a workable balance between smart growth and species protection. This approach allows for preservation of entire ecosystems on a large scale, rather than on a single-species, project-by-project basis, as under the original state and federal species protection laws (City of San Diego 2013b). The portion of the MSCP that is within the City of San Diego’s jurisdiction is governed by the City of San Diego MSCP Subarea Plan, which includes the City of San Diego’s MHPA boundary. The Otay River Floodplain Site is located within the boundaries of the City of San Diego’s MHPA. Although the Service is not subject to overview by the City of San Diego, the Service’s management proposals for this area, as described within the San Diego Bay NWR CCP, are consistent with the recommendations presented in the MSCP for this area. Specifically, the City of San Diego MSCP Subarea Plan recommends that future use of the site be compatible with the resource goals and objectives of the MHPA and other regulations and policies applicable to the site, or be enhanced or restored (City of San Diego 1997b). The MSCP Subarea Plan also states that the area at the mouth of the Otay River should be enhanced or restored to tidelands once it is no longer used for solar salt production (City of San Diego 1997b).

Military Operations

San Diego Bay supports three major naval bases: Naval Base San Diego, Naval Base Point Loma, and Naval Base Coronado. The closest operating facility to the project site is the Naval Radio Receiving Facility, which is used primarily by Naval Special Warfare for clandestine training. The Navy, in coordination with the Port and a committee of government agencies and non-governmental organizations, prepared an Integrated Natural Resources Management Plan in 2013 (NAVFAC and Port 2013). The document ensures compliance with natural resource protection laws and stewardship of these resources within San Diego Bay while supporting the ability of the Navy and the Port to continue functioning successfully within this area. The Navy equips, maintains, trains, and supports Naval surface and aviation units of the Pacific Fleet in this area while supporting the eastern and northern Pacific Ocean naval operations. The Port is a public benefit corporation and special government entity that manages the San Diego harbor and administers the public lands along much of San Diego Bay. The Integrated Natural Resources Management Plan serves as a planning tool, management guide, reference document, and policy strategy for the Navy and the Port to support the continuing function of their actions within San Diego Bay and provide direction for the good stewardship of natural resources (NAVFAC and Port 2013).

3.5.2 Traffic, Circulation, and Parking

This section describes the existing roadways and available parking areas within the immediate vicinity of the project site. Bicycle and pedestrian access points surrounding the project site are described in Section 3.5.4, Public Access and Recreational Opportunities. Data used to assess traffic and parking conditions in the area of the proposed action were derived from the San Diego Association of Governments, the City of San Diego, and the San Diego Bay NWR Final CCP and Environmental Impact Report (USFWS 2006).

Existing Roadways

The following local streets provide access to the San Diego Bay NWR and surrounding area: Palomar Street, West Frontage Road, Anita Street, Main Street, Bay Boulevard, Palm Avenue, Saturn Boulevard, and 13th Street. These roadways are described below and shown in Figure 1-2, Vicinity Map, in Chapter 1. Tables 3.5-1 and 3.5-2 provide road classification and trip volume data for these roadways and the major intersection within the proposed action's area of influence.

Interstate 5

I-5 runs north/south and is located approximately 0.5 mile east of the project site. This interstate freeway provides regional access from the project site to surrounding jurisdictions.

Palomar Street

Palomar Street, which runs east/west, provides one of two connections from the project site to I-5. The western terminus of Palomar Street is the north side of Pond 40, as indicated in Figure 1-2. The interchange of I-5 and Palomar Street provides access to the industrial and commercial uses located along Bay Boulevard.

West Frontage Road

In the vicinity of the project site, West Frontage Road is a two-lane light collector with a designated bike lane and parking available on either side of the roadway. The roadway is located west of and runs parallel to I-5, extending from Main Street north to Stella Street, which is just south of Palomar Street.

Anita Street

Anita Street is a local two-lane roadway that extends east/west under I-5. It connects West Frontage Road to Bay Boulevard, which is its western terminus.

Bay Boulevard

Bay Boulevard is a two-lane light collector that runs north/south along the eastern boundary of the South Bay Salt Works. North of Palomar Street, Bay Boulevard includes a sidewalk on the east side of the street and a Class I bike lane, a portion of the Bayshore Bikeway to the west of the street. The Class I segment of the Bayshore Bikeway ends just north of the intersection of Bay Boulevard and Palomar Street. No parking is permitted on this portion of the roadway. On Bay Boulevard south of Palomar Street, no on-street parking is permitted, and a painted bike lane is provided up to the intersection with Stella Street. Beyond Stella Street, the roadway narrows and no shoulder or bike lane is provided.

Main Street

In the project vicinity, Main Street is a two-lane collector street running east/west over I-5. Freeway ramps provide full access to Main Street to the east and the west. Main Street terminates just west of the I-5 southbound off-ramp. The portion of this roadway located to the west of I-5 does not have a shoulder, parking, or designated bike lane.

Palm Avenue

Palm Avenue, also referred to as State Route 75, is classified as a six-lane prime arterial. This roadway runs through the jurisdiction of the cities of Coronado, Imperial Beach, and Chula Vista, and provides access to a high volume of traffic.

Saturn Boulevard

Saturn Boulevard is a four-lane major roadway within the jurisdiction of the City of San Diego. This roadway terminates to the south of the project site. A bike path maintained by the City of San Diego Street Division extends north of the Saturn Boulevard terminus through the Otay River floodplain, but outside the boundaries of the San Diego Bay NWR, ending at Main Street and providing bicycle access to the Bayshore Bikeway.

13th Street

13th Street is a three-lane light collector providing access to residential areas to the southwest of the project site. On-street parking is available along both sides of 13th Street, and several additional parking stalls are available at the northern terminus of the street where it connects to the Bayshore Bikeway. The terminus of 13th Street is directly west of the western boundary of the Otay River Floodplain Site.

Table 3.5-1
Surrounding Streets 2010 Average Weekday Trip Volume

Street	Street Segment	Jurisdiction	Classification[1]	Capacity at LOS D[2]	Average Weekday Trip Volume[1]
West Frontage Road	Anita Street to Main Street	City of Chula Vista	2-Lane Light Collector	6,500	1,900
Anita Street	Bay Boulevard to West Frontage Road	City of Chula Vista	Local	—	—
Palomar Street	I-5 to Bay Boulevard	City of Chula Vista	4-Lane Major	30,000	6,600
Bay Boulevard	Palomar Street to Main Street	City of Chula Vista	2-Lane Light Collector	12,000	1,900
Main Street	West Frontage Road to I-5	City of Chula Vista	2-Lane Collector	9,000	1,900
	I-5 to Alamitos Avenue	City of Chula Vista	4-Lane Major	35,000	29,200
I-5	L Street to Palomar Street	City of Chula Vista	Freeway	70,000	157,900
	Palomar Street to Main Street	City of Chula Vista	Freeway	70,000	161,100
	Main Street to Palm Avenue	City of San Diego	Freeway	70,000	157,900
Palm Avenue/State Route 75	13th Street to Saturn Boulevard	City of Imperial Beach/City of San Diego	6-Lane Prime	55,000	43,100
	Saturn Boulevard to I-5	City of San Diego	6-Lane Prime	55,000	62,900
Saturn Boulevard	Boundary Avenue to Doris Street	City of San Diego	4-Lane Major	35,000	22,100
	Doris Street to Palm Avenue	City of San Diego	4-Lane Major	35,000	23,400

Table 3.5-1
Surrounding Streets 2010 Average Weekday Trip Volume

Street	Street Segment	Jurisdiction	Classification[1]	Capacity at LOS D[2]	Average Weekday Trip Volume[1]
13th Street	Palm Avenue to Elm Avenue	City of Imperial Beach	3-Lane Light Collector	N/A[3]	11,500

LOS = level of service; N/A = not applicable.
1 **Sources:** Non I-5 segments: SANDAG 2014; Average Daily: SANDAG 2010; I-5 Segments: Caltrans 2013.
2 **Sources:** City of Chula Vista 2005; City of San Diego 1998, 2008.
3 This roadway segment is within the City of Imperial Beach, which does not have an adopted city-specific average daily traffic threshold for classifications of roadway segments. Additionally, the City of Imperial Beach maintains a standard of level of service (LOS) C or better for arterial and local streets.

Table 3.5-2
Potentially Impacted Intersections within the Project Vicinity

Intersection	Jurisdiction	Peak Hour	Delay	LOS
Bay Boulevard and Palomar Street	City of Chula Vista/City of San Diego	AM	9.6	A
		PM	13.5	B

Source: The Perfect Solution 2010.

Public Transit

A variety of public transit services surround the project site, including bus and trolley services. These services are primarily provided by the San Diego Metropolitan Transit System, and include bus services and trolley routes that serve the cities of Chula Vista, National City, and San Diego.

Bus

The Metropolitan Transit System operates the bus transit system in the general vicinity of the project site. The closest bus stops to the project site are located on Palomar Street and Palm Avenue. The Palm Avenue stop is served by Routes 932, 933, and 934 at the intersection of Industrial Boulevard and Palm Avenue, approximately 0.55 mile southeast of the Otay River Floodplain Site. The Palomar Street stop is served by Routes 701, 704, and 712 at the intersection of Industrial Boulevard and Palomar Street, approximately 0.75 mile east of the Pond 15 Site.

Trolley

San Diego Trolley Inc., a wholly owned subsidiary of the Metropolitan Transit System, operates the Blue Line, which provides service between Old Town San Diego and San Ysidro on the border with Mexico. The trolley line is located to the east of I-5 and would not be affected by the proposed action.

Parking

On-street parking availability in the vicinity of the Otay River Floodplain Site is very limited. No parking is permitted along Main Street west of I-5, and parking is not permitted on West Frontage Road until about 600 feet to the north of its intersection with Main Street, where some on-street parking is available along the west side of the street. Parking for trail users is available at the western terminus of Main Street, near the Otay River Floodplain Site, and at the northern terminus of Saturn Boulevard, located to the south of the Otay River Floodplain Site. Both parking areas are intended for use by visitors to the Otay River Valley Regional Open Space Park and the park's regional trail system that extends from these points east through the Otay River Valley.

On-street parking in the vicinity of the Pond 15 Site is also limited. No parking is permitted along Bay Boulevard. The closest on-street parking is located along Palomar Street, Stella Street, and Ada Street, all of which are used by employees of surrounding businesses during the workweek. A parking area associated with the South Bay Salt Works is located approximately 0.5 miles southeast of the Pond 15 Site, but available spaces are limited at this location during the workweek.

Current San Diego Bay NWR Trip Generation

The San Diego Bay NWR is estimated to generate fewer than 100 vehicle trips per day from activities associated with Service employee visits to this portion of the San Diego Bay NWR for maintenance and monitoring, occasional tours of the salt works, intermittent truck trips associated with the sale of salt and salt-associated byproducts, deliveries related to the salt operation, South Bay Salt Works employee-related trips, and other activities associated with the current solar salt operation. The Otay River Floodplain Site is currently undeveloped, and traffic associated with general maintenance and management is minimal.

3.5.3 Public Utilities/Easements

Information regarding public utilities, including sewer and water lines, storm drains, underground gas lines, fiber-optic conduit, and electrical transmission lines are described in this section. Land dedicated to currently unimproved roadways and easements for potential future utilities are also presented. The information provided in this section is based on the *Otay River Estuary Restoration Project Existing Utility Investigation Final Report* conducted by Everest International Consultants in August 2015, provided as Appendix L of this EIS.

Otay River Floodplain Site

The portion of the Otay River floodplain located just to the east of the project site contains a number of above- and below-ground public utilities. These utilities are located in easements created prior to the establishment of the San Diego Bay NWR and/or within dedicated, unimproved street sections owned by the City of San Diego. The majority of the utilities present in this area extend north/south along the closed portion of Saturn Boulevard (see Figures 3.5-2 through 3.5-6 for utility locations). At a point just south of where the existing Saturn Boulevard bike path crosses the Otay River, the utility easement in which most of the utilities that extend along Saturn Boulevard occur turns to the east making a diagonal connection between the bike path and the western terminus of Main Street (see Figures 3.5-2, 3.5-3, and 3.5-6). This corridor contains an 8-inch-diameter and 3-inch-diameter gas line, an underground 3-inch-diameter PVC electrical transmission conduit, overhead power lines, a 2-inch-diameter fiber-optic conduit, a 57-inch-diameter sewer force main, and a 54-inch-diameter sewer interceptor line (the South Metro Interceptor). Several manholes associated with these utilities are present along the bike path. Other utilities in the area that occur to the east of Saturn Boulevard include 36-inch, 30-inch, and 27-inch-diameter gravity sewer lines; a 24-inch-diameter storm drain, a 2-inch-diameter fiber-optic conduit, an underground 3-inch-diameter PVC electrical transmission conduit, and a 4-inch-diameter gas line. The only known facilities located to the west of the Saturn Boulevard utility easement are two abandoned sewer lines associated with a long-since removed sewer pump station (the old Palm City public station) (Appendix L).

Pond 15 Site

No utilities are located within the Pond 15 Site. The closest utilities include the underground 54-inch-diameter South Metro Interceptor pipeline and overhead electrical distribution lines within or adjacent to Bay Boulevard. There is also a storm drain that runs north/south to the west of the existing railroad line.

3.5.4 Public Access and Recreational Opportunities

The San Diego Convention & Visitors Bureau estimated that 31.1 million people visited the San Diego Region in 2011 (San Diego Convention & Visitors Bureau 2012). San Diego Bay and the open space areas that surround it serve as an established destination for tourists and residents. Public access is restricted within the Otay River Floodplain Site and Pond 15 Site, but there are numerous areas in the vicinity that provide a variety of recreation opportunities, including boating, fishing, wildlife observation, biking, and hiking, as described in this section. Although public access is restricted for the project site, guided birding tours are conducted during the fall and winter along the salt pond levees.

Boating

The waters within the south end of San Diego Bay are relatively shallow, limiting the type of boats that can be used in the area. Many of these boats are used for wildlife viewing, exercising, and fishing, or for general recreation purposes. No boat access is permitted in proximity to the salt pond levees, within the restored western salt ponds, or in any portion of the Otay River that is located within the San Diego Bay NWR boundary.

Fishing

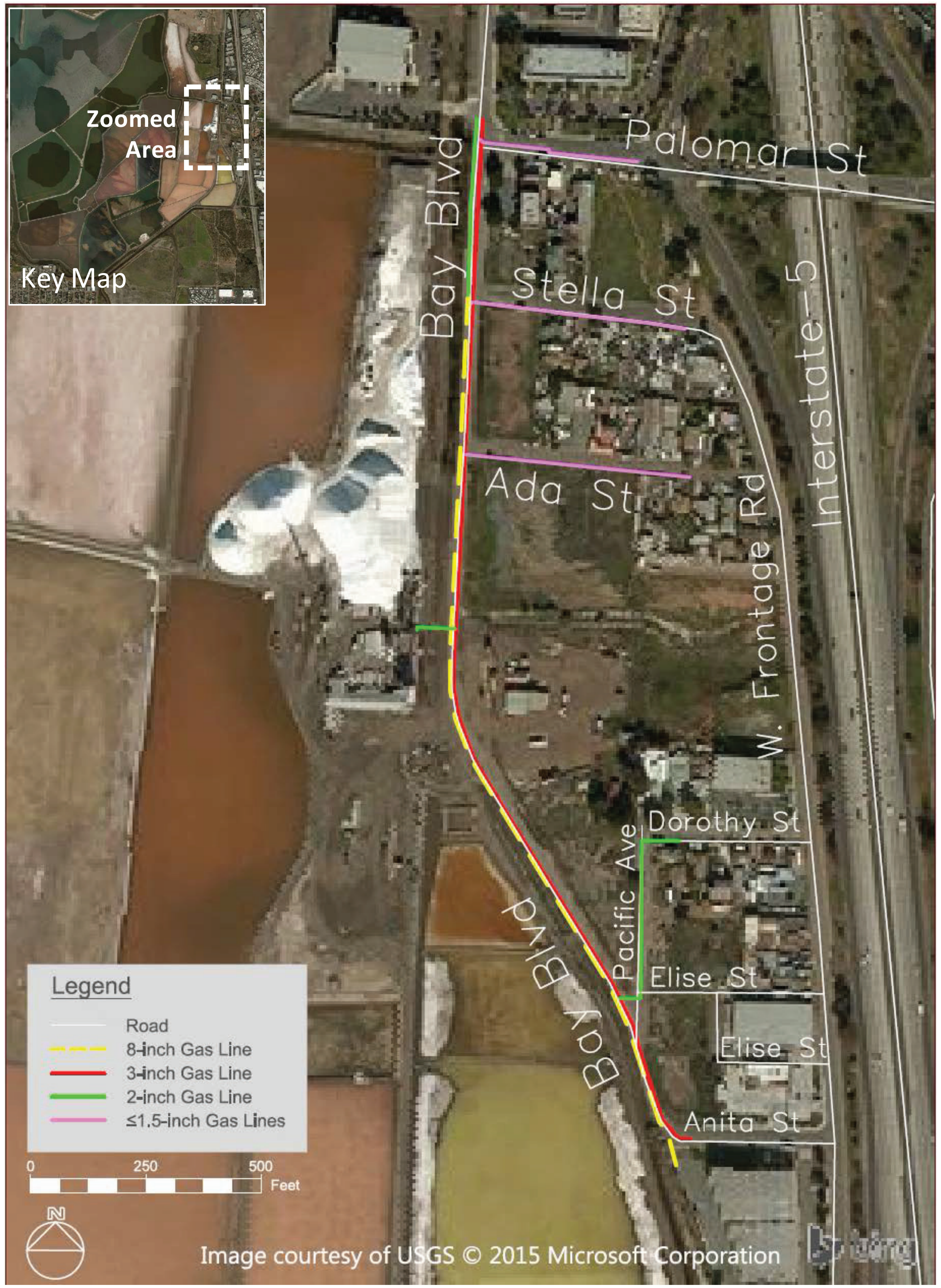
Fishing is permitted in the open waters of San Diego Bay, but not from any shoreline in the San Diego Bay NWR, in the salt ponds, or in the restored western salt ponds. The project site does not contain any areas or improvements dedicated to fishing.

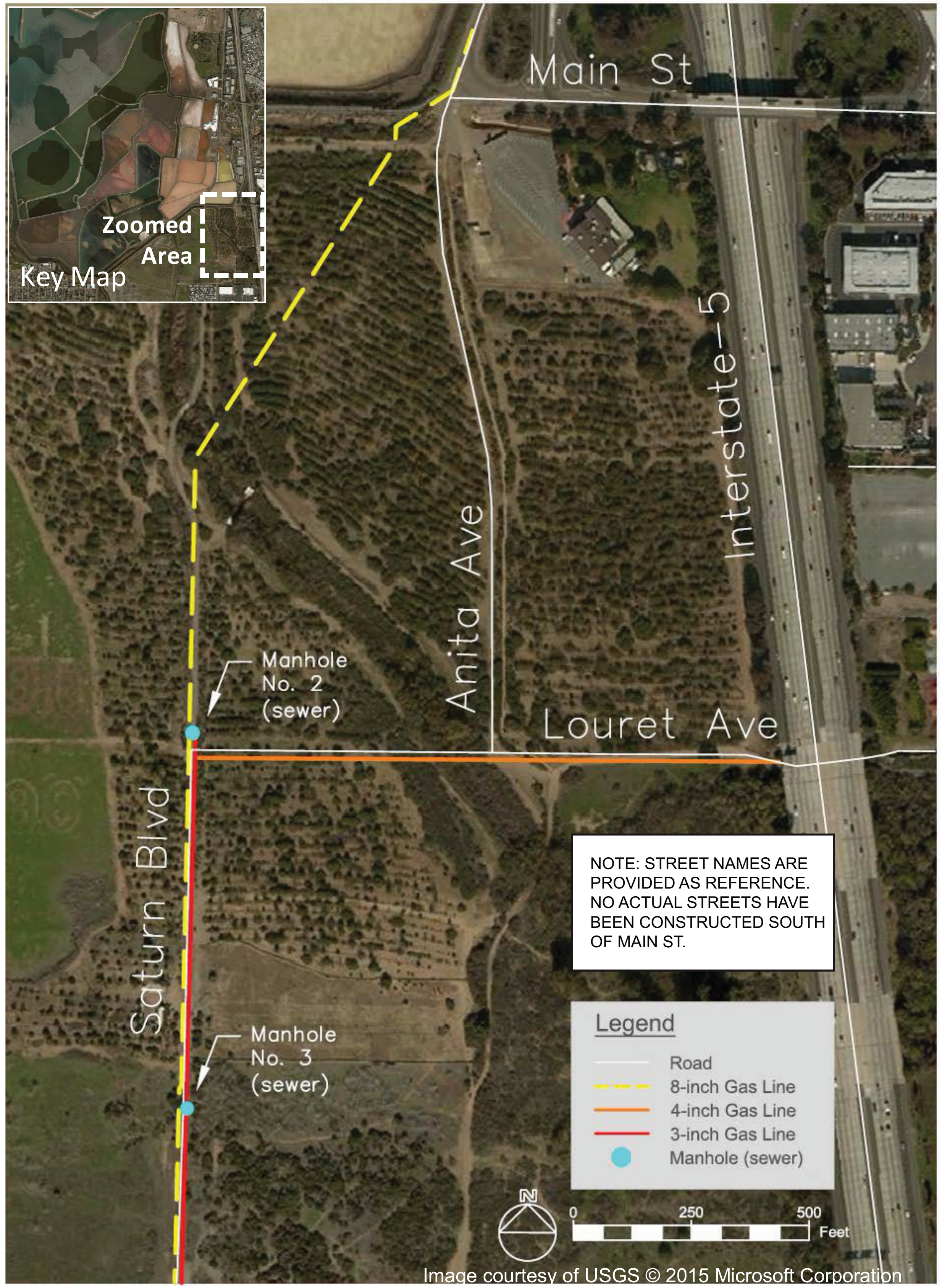
Wildlife Observation

The Bayshore Bikeway runs along the northern edge of the Otay River, which is adjacent to the northern boundary of the Otay River Floodplain Site. The bikeway offers the public opportunities to observe wildlife on the project site and in the surrounding areas, including the salt ponds. Some wildlife observation opportunities are also available from kayaks and other small boats in authorized areas of the South Bay. Occasional guided tours within the South Bay Salt Works during the fall and winter months support wildlife observation and photography.

Bicycle and Pedestrian Facilities

The primary bicycle facility located near the project site is the Bayshore Bikeway, which supports recreational users and commuters. This bikeway passes directly to the north of the Otay River Floodplain Site between the salt ponds and the Otay River channel within the old Coronado Branch of the San Diego & Arizona Eastern railroad right-of-way (USFWS 2006). This segment of the bicycle path provides views of the salt ponds and the Otay River Floodplain Site. The bikeway currently ends at the western terminus of Main Street, where riders share the road with cars until the bikeway resumes just north of the intersection of Bay Boulevard and Palomar Street.





SOURCE: Everest International Consultants, Inc. 2015

FIGURE 3.5-2
Approximate Location of Existing Gas and Oil Pipelines

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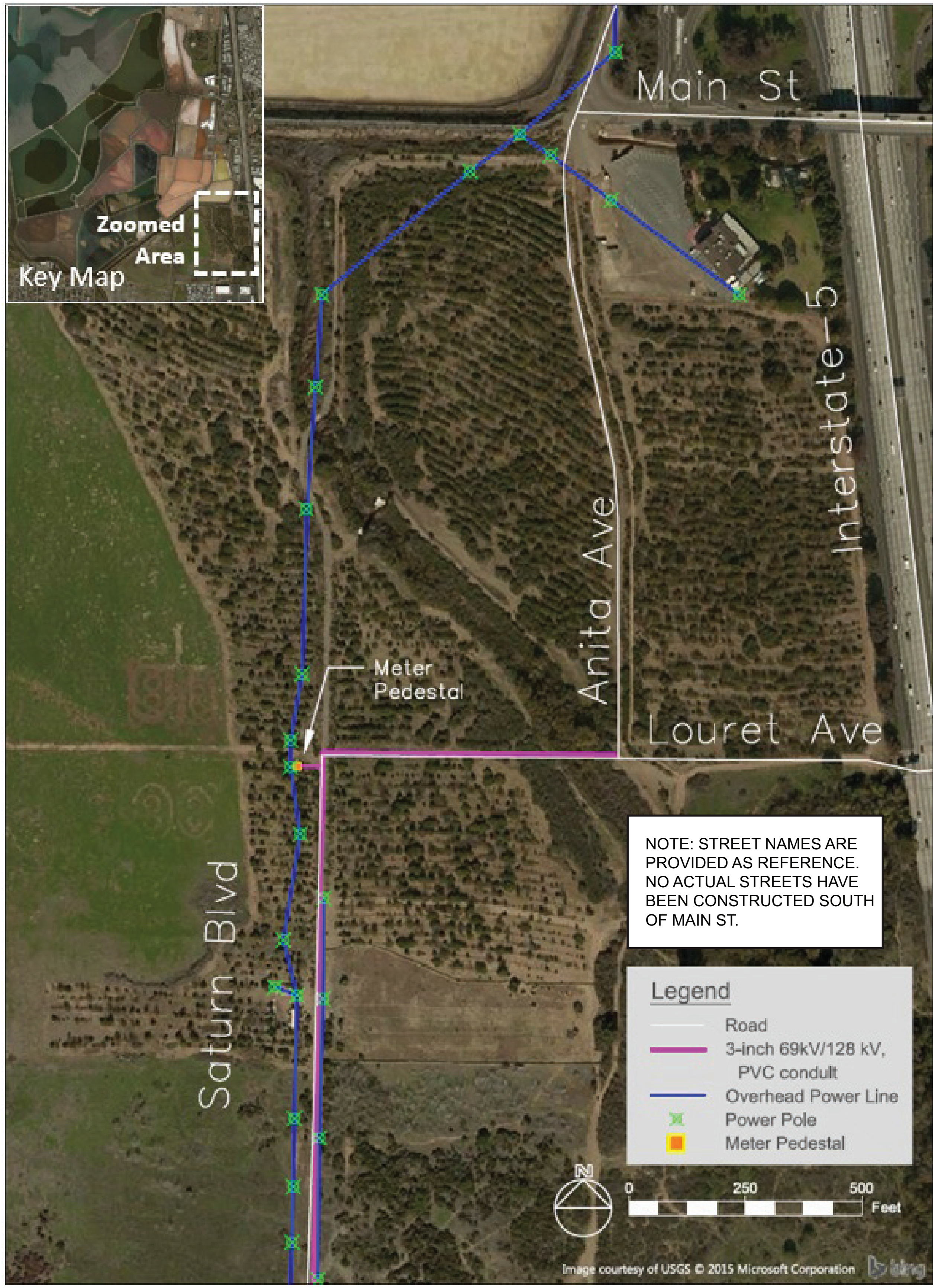

SOURCE: Everest International Consultants, Inc. 2015

FIGURE 3.5-3
Approximate Location of Existing Power Utilities

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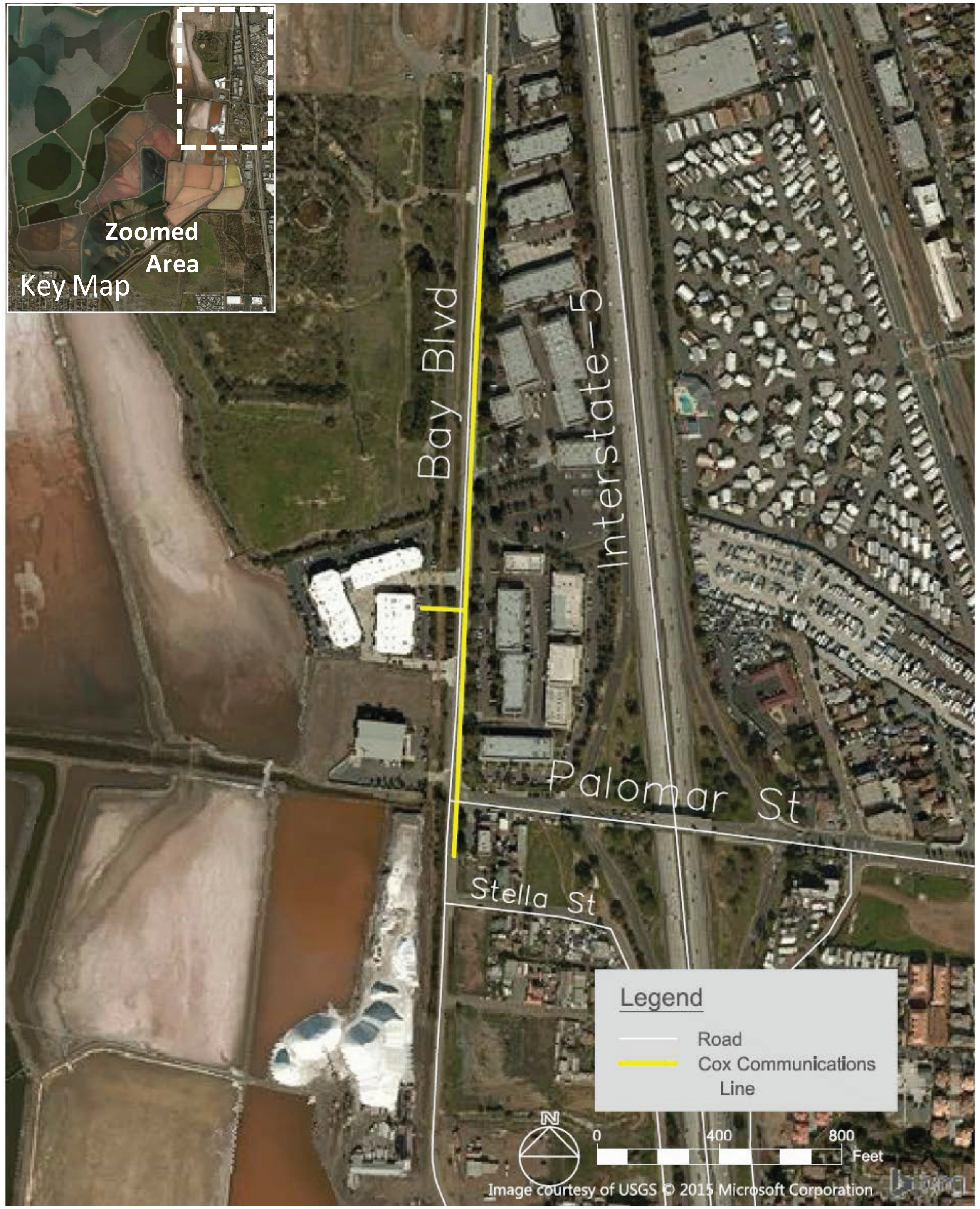

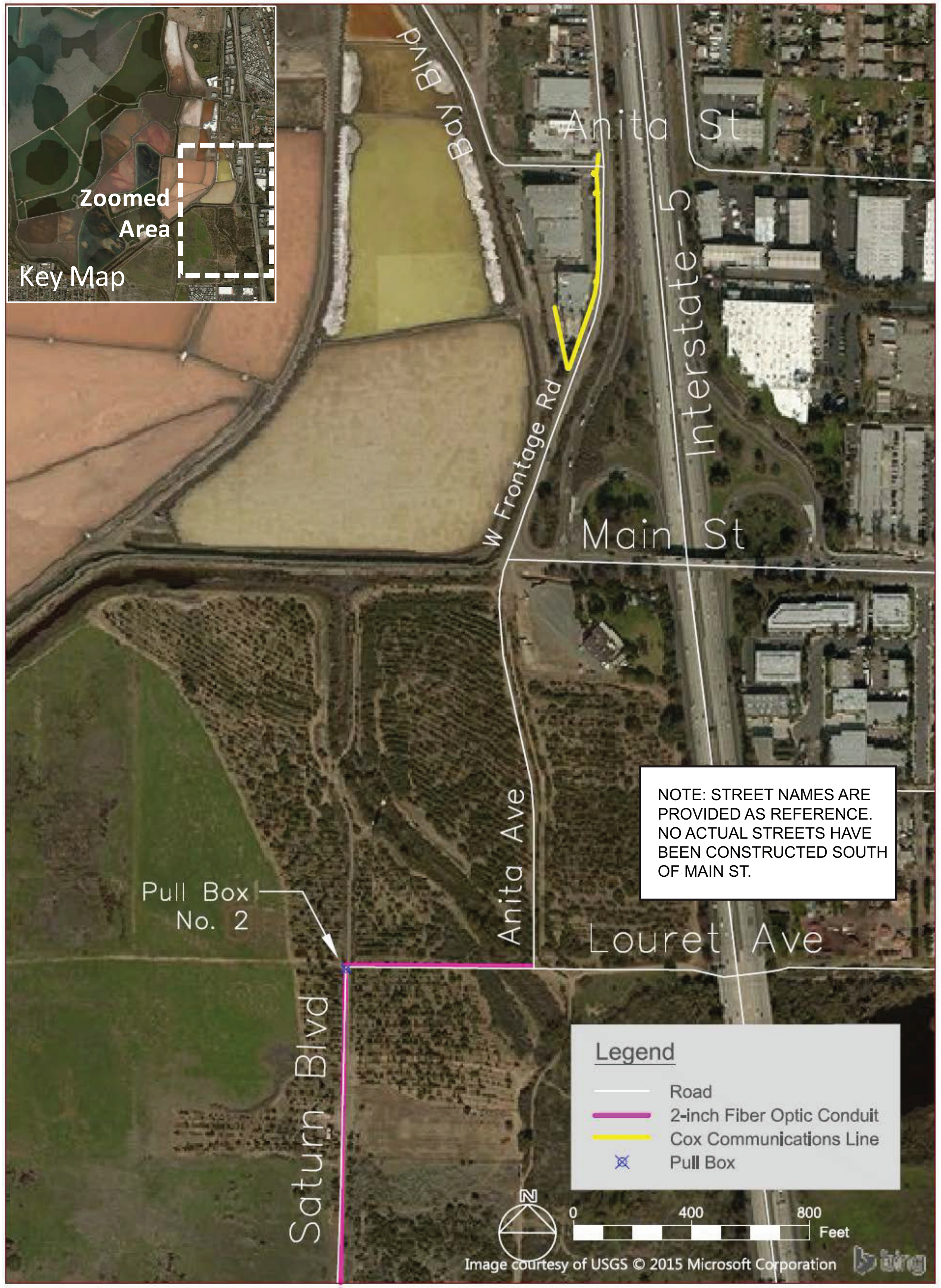

SOURCE: Everest International Consultants, Inc. 2015

FIGURE 3.5-4
Approximate Location of Existing Communications Utilities

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SOURCE: Everest International Consultants, Inc. 2015

FIGURE 3.5-5

Approximate Location of Existing Water and Storm Drain Pipelines

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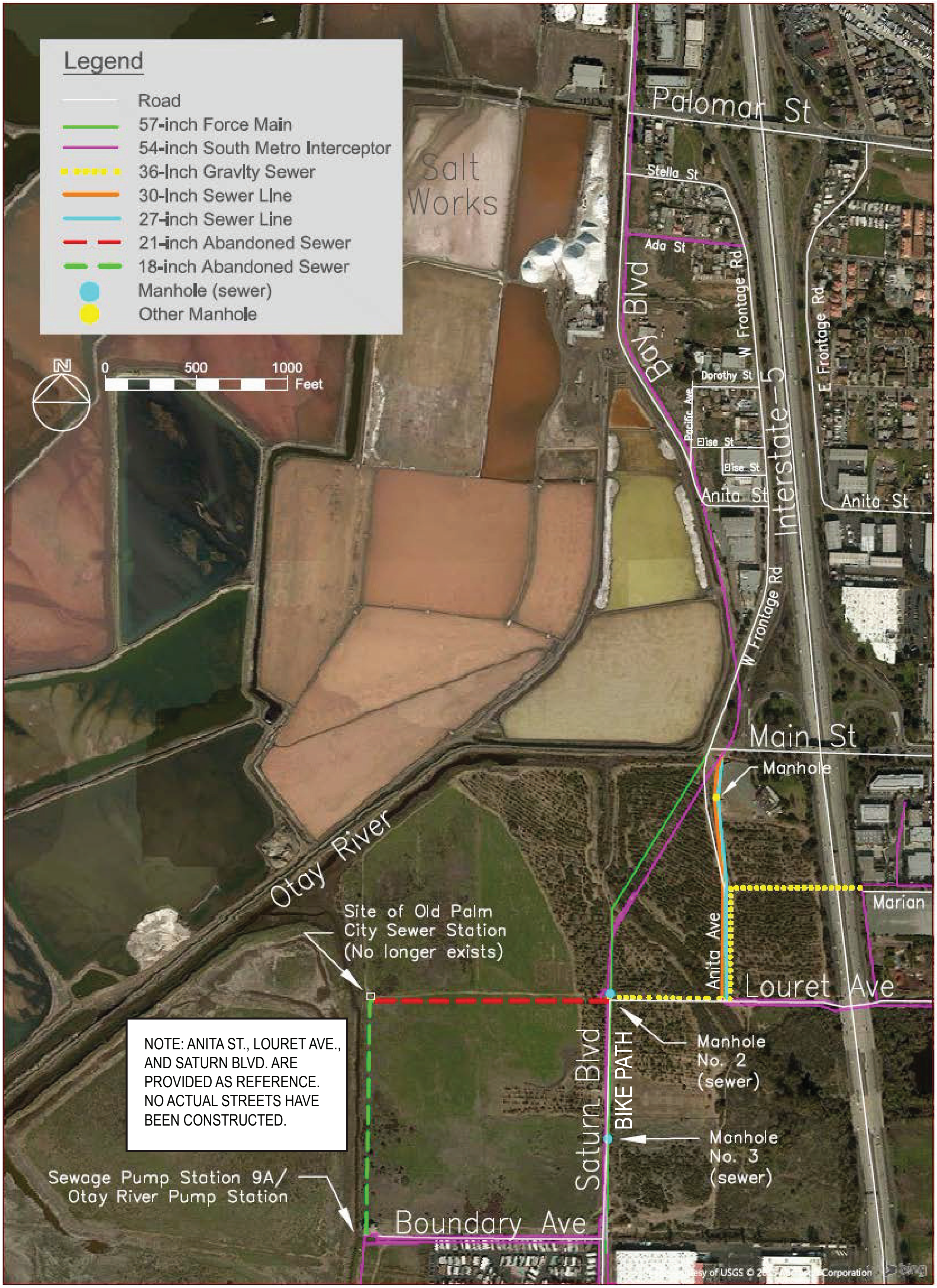

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SOURCE: Everest International Consultants, Inc. 2015

FIGURE 3.5-6
Approximate Location of Existing Sewer Pipelines

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Another bike path maintained by the City of San Diego extends north from the Saturn Boulevard right-of-way along the eastern boundary of the Otay River Floodplain Site. This path runs between Palm Avenue to the south and Main Street to the northeast of the Otay River Floodplain Site.

East of the Otay River Floodplain Site is the western extension of the Otay River Valley Regional Trail. After crossing under the I-5 bridge at the Otay River, this trail proceeds northwest where it meets Main Street and southwest where it meets the northern extent of Saturn Boulevard. Staging areas are provided at the north and south ends of this trail.

3.5.5 Vectors and Odors

Environmental conditions or wildlife that can cause offensive odors or serious public health issues are described in this section using information from the County of San Diego Department of Health Vector Control Program's 2013 Annual Report (County of San Diego 2013). The potential for vector breeding and odor generation is similar within both the Otay River Floodplain Site and the Pond 15 Site. Although brine flies are not considered a vector, substantial populations of these are generated within the salt ponds.

Vectors

A vector is any insect or other arthropod, rodent, or animal of public health significance capable of causing human discomfort or injury, or capable of harboring or transmitting the causative agents of human disease. The most prominent vector in the vicinity of the project site is the mosquito. Of the world's 3,000 mosquito species, more than 50 live in California, and 24 have been identified in San Diego County. Seven species of mosquitoes found in San Diego County have the potential to transmit diseases: *Culex tarsalis*, *Culex quinquefasciatus*, *Culex erythrothorax*, *Anopheles hermsi*, *Culex thriambus*, *Culex restuans*, and *Ochlerotatus sierrensis* (County of San Diego 2015).

Various mosquito species have been documented at the San Diego Bay NWR, and several are known to carry western equine encephalomyelitis virus, St. Louis encephalitis virus, and/or West Nile virus. The County of San Diego, Department of Environmental Health, has a mosquito surveillance trap located near the intersection of Hollister Street with the Otay River. Based on trapping results from 2003, species of mosquitoes likely to occur in and around the project site when conditions are appropriate (USFWS 2006), include the following:

- *Anopheles hermsi* – This species of mosquito is very common in the Otay traps. Where malaria exists, this species is known as a very competent vector of the disease.

- *Culex tarsalis* – This species is a fairly common vector mosquito in San Diego County and is quite common in the Otay River trap. It is most active in the spring, winter, and fall.
- *Culex erythrothorax* – This species, which is the most common mosquito species in San Diego County, is very common in the Otay River trap. It is typically considered a nuisance, but has also been observed to vector disease.
- *Culex pipiens/quinquefasciatus* – A fairly competent disease vector, this species is only detected in measurable numbers when stagnant water is present.
- *Culiseta incidens* – Regularly found in the Otay River trap in small to moderate numbers, this species is not considered to be a disease vector, but can be a biting nuisance. It can breed in fresh or brackish water.
- *Culiseta inornata* – This species, which breeds in fresh or brackish water, is not common in the Otay River trap, but when it is present, it usually occurs in small numbers during the cooler months. This mosquito is also considered a nuisance and is not an important disease vector.
- *Culex stigmatosoma* – This relatively uncommon mosquito is active during the summer months close to its larval habitat or close to natural and built polluted waters such as sewage and dairy ponds. These vectors feed primarily on birds and rarely bite humans.
- *Ochlerotatus increpitus* – This species, which breeds in many freshwater situations, can also be commonly found in the Otay traps. An annoying day biter, this species represents more of a nuisance than a disease vector.
- *Ochlerotatus sierrensis* – This species, which breeds in tree holes and bites during the day, is often found in the traps in very small numbers. This mosquito is known to transmit heartworm to dogs.
- *Ochlerotatus squamiger* – This species generally occurs in intertidal marshes of the California coast, where the female lays eggs in puddles in the extreme high tide zone. When present, it is most common in February and March. This species was not observed in the traps in 2003; however, it has occurred in the South Bay region in the past.
- *Ochlerotatus taeniorhynchus* – This species, which is common in salt marsh habitat, is typically present between May and October. It is not considered a significant vector, but can be a day biting nuisance.

Two other mosquito species with the potential to occur within the project site are *Culiseta particeps* and *Aedes dorsalis*.

Potential breeding habitat near the Otay River Floodplain Site for these vectors includes fresh and brackish water in the Otay River and Nestor Creek, any shallow saltwater areas that form along river and creek edges, and puddles that result from rainfall or tidal fluctuation. In the vicinity of the Pond 15 Site, the most likely breeding habitat is within the Palomar Channel, located immediately to the east.

Odors

Odors in the vicinity of the project site could be produced from shallow water, warm water, and increased nutrient concentrations that favor algal growth and result in low dissolved oxygen levels. Ponds 20 and 22 located adjacent to the project site to the north are most prone to generating strong odors from these sources (USFWS 2006).

3.5.6 Economics/Employment

Demographic and socioeconomic data used to assess social and economic conditions in the vicinity of the proposed action include population, employment, income, and industry data obtained from the U.S. Census Bureau, San Diego Association of Governments, and Bureau of Economic Analysis for communities surrounding the San Diego Bay. Subject communities and jurisdictions are the cities of Imperial Beach, Coronado, National City, Chula Vista, and San Diego, and the County of San Diego.

Population

The County of San Diego and incorporated municipalities support a diverse economic environment encompassing academic, private, and public-sector industries (including a large government sector due to a prominent military presence consisting of U.S. Navy and Marine installations in the northern-most and southern-most portions of San Diego County). Recreational and tourism-based industries contribute significantly to local and regional income generation, namely in and around the Port, Sea World, Del Mar Race Track, and numerous coastal recreational opportunities.

Table 3.5-3 shows recent population levels, growth rates, and population densities for California; San Diego County; and the cities of Imperial Beach, Coronado, National City, Chula Vista, and San Diego. As shown in the table, of the municipalities surrounding the project site, the two largest in both population and size in 2010 were the City of San Diego and the City of Chula Vista. However, National City and the City of Imperial Beach were the most densely populated of the municipalities in the San Diego Bay area (SANDAG 2011).

The table also demonstrates how San Diego County, National City, and the City of San Diego all grew at or slightly below the overall population growth rate for the entire State of California from 2000 to 2010. Proportionally, the City of Chula Vista grew at a faster rate than the surrounding jurisdictions or the State of California, with an average annual growth rate of approximately 4.1%. Two of the municipalities experienced a loss in population from 2000 to 2010. The City of Imperial Beach had a slight decrease in population from 2000 to 2010, with an average annual growth rate of –0.2%, and the City of Coronado experienced a much greater loss in population with an average annual growth rate of –2.2%. The City of Imperial Beach and National City remain the most densely populated municipalities in the San Diego Bay area relative to population per square mile. San Diego County is estimated to continue its current growth rate, which would result in a population of approximately 4,384,867 by the year 2050 (SANDAG 2011).

Table 3.5-3
Population Levels, Growth Rates, and Density

Area	Population Levels		Population Growth Rates		Population per Square Mile		
	2000	*2010*	*2000–2010*	*Average Annual Growth Rate*	*2000*	*2010*	*Land Area (square miles)*
California	33,871,648	37,253,956	10.0%	1.0%	217.4	239.1	155,779.2
San Diego County	2,813,833	3,095,313	10.0%	1.0%	668.9	735.8	4,206.6
Imperial Beach (city)	26,992	26,324	–2.5%	–0.2%	6,488.5	6,327.9	4.2
Coronado (city)	24,100	18,912	–21.5%	–2.2%	3,039.1	2,384.9	7.9
National City (city)	54,260	58,582	8.0%	0.8%	7,453.3	8,047.0	7.3
Chula Vista (city)	173,556	243,916	40.5%	4.1%	3,497.0	4,914.7	49.6
San Diego (city)	1,223,400	1,307,402	6.9%	0.7%	3,762.1	4,020.4	325.2

Sources: SANDAG 2012; U.S. Census Bureau 2010.

Economic Conditions

The following discussion highlights the distribution of employment by industry, incomes, and recent trends occurring in the vicinity of the project site. Data for 2010 are included since this year represents the most recent data available for personal income, employee compensation, and employment by industry. In 2010, San Diego County's personal income was $141.68 billion, and approximately 67% of personal income (nearly $95 billion) was from employee compensation. Personal income includes income "received by all persons from all sources," and is calculated as the sum of wage and salary disbursements, supplements to wages and salaries, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and personal current transfer receipts, less contributions for government social insurance (BEA 2010).

As shown in Table 3.5-4, San Diego County's total employment level was 1,818,107 in 2010. Within this population, government and government enterprises represent the largest employer in San Diego County and account for approximately 18.8% of those people who were employed during 2010, followed by professional, scientific, and technical services at 10.3%. Other important employment industries within San Diego County include the retail trade, professional services, healthcare and social assistance, and accommodation and food services (BEA 2010).

Table 3.5-4
San Diego County, California, Personal Income, Employee Compensation, and Employment by Industry (2010)

Industry	Personal Income ($1,000s)	Percent of Total	Employee Compensation ($1,000s)	Percent of Total	Employment (number)	Percent of Total
Total	141,678,210	100%	94,797,759	100%	1,818,107	100%
Farm	451,974	0.3%	316,447	0.3%	12,854	0.7%
Non-Farm	105,599,242	74.5%	75,481,312	79.6%	1,805,253	99.3%
Total private	76,776,743	54.2%	65,658,813	69.3%	1,464,204	80.5%
Forestry, fishing, related activities	74,588	0.1%	53,791	0.1%	2,820	0.2%
Mining	41,777	0.0%	31,304	0.0%	3,463	0.2%
Utilities	1,060,649	0.7%	1,048,041	1.1%	7,509	0.4%
Construction	5,519,595	3.9%	4,049,206	4.3%	82,230	4.5%
Manufacturing	9,037,945	6.4%	8,777,801	9.3%	102,820	5.7%
Wholesale trade	3,812,422	2.7%	3,475,726	3.7%	50,947	2.8%
Retail trade	5,735,225	4.0%	4,921,874	5.2%	166,101	9.1%
Transportation and warehousing	1,345,371	0.9%	1,108,604	1.2%	29,646	1.6%
Information	2,814,078	2.0%	2,502,470	2.6%	31,647	1.7%
Finance and insurance	5,023,865	3.5%	4,317,612	4.6%	89,096	4.9%
Real estate and rental and leasing	2,372,411	1.7%	1,485,161	1.6%	98,858	5.4%
Professional, scientific, and technical services	15,105,759	10.7%	12,638,431	13.3%	187,904	10.3%
Management of companies and enterprises	1,904,632	1.3%	1,899,703	2.0%	18,853	1.0%
Administrative and waste services	4,028,333	2.8%	3,563,258	3.8%	111,466	6.1%
Educational services	1,342,514	0.9%	1,253,075	1.3%	38,351	2.1%
Healthcare and social assistance	8,695,867	6.1%	7,539,454	8.0%	150,533	8.3%
Arts, entertainment, and recreation	1,339,958	0.9%	1,075,482	1.1%	45,869	2.5%
Accommodation and food services	3,819,455	2.7%	3,420,962	3.6%	140,613	7.7%

Table 3.5-4
San Diego County, California, Personal Income, Employee Compensation, and Employment by Industry (2010)

Industry	Personal Income ($1,000s)	Percent of Total	Employee Compensation ($1,000s)	Percent of Total	Employment (number)	Percent of Total
Other services except public administration	3,702,299	2.6%	2,496,858	2.6%	105,478	5.8%
Government and government enterprises	28,822,499	20.3%	28,822,499	30.4%	341,049	18.8%
Federal, civilian	5,217,008	3.7%	5,217,008	5.5%	47,246	2.6%
Military	11,287,330	8.0%	11,287,330	11.9%	110,885	6.1%
State and local	12,318,161	8.7%	12,318,161	13.0%	182,918	10.1%
State government	2,816,520	2.0%	2,816,520	3.0%	41,537	2.3%
Local government	9,501,641	6.7%	9,501,641	10.0%	141,381	7.8%

Source: BEA 2010.

As shown in Table 3.5-5, the various jurisdictions surrounding San Diego Bay have been affected differently by economic trends relative to employment. The only municipalities experiencing unemployment levels below the average unemployment rate for California are the cities of Coronado and San Diego at 6.1% and 9.5%, respectively, in March 2012. Additionally, National City was experiencing an unemployment rate of 18.2%, and the City of Imperial Beach had an unemployment rate of 15.2% in March 2012, both of which are at or above the average unemployment rate for San Diego County (BLS 2012).

Table 3.5-5
Unemployment Rate March 2012

Jurisdiction	Unemployment Rate
California	11.1%
San Diego County	15.2%
Imperial Beach (city)	15.2%
Coronado (city)	6.1%
National City (city)	18.2%
Chula Vista (city)	11.1%
San Diego (city)	9.5%

Source: BLS 2012.

The Otay River Floodplain Site does not currently contain any businesses or commercial enterprises that involve direct employment. However, the open space, wildlife preservation areas, and opportunities for public access available elsewhere on the San Diego Bay NWR, such as the Bayshore Bikeway, contribute to tourism and recreation in the South San Diego Bay area.

The Pond 15 Site is one of four primary ponds currently in use by the South Bay Salt Works, a commercial solar salt operation that employs between 20 and 30 individuals. Approximately 70,000 tons of salt are produced per year (Yuen, pers. comm. 2014b). As of 2006, the South Bay Salt Works generated approximately $300,000 in local and state sales tax annually (USFWS 2006).

Although this area is not identified as having value for production of agricultural resources, salt production in San Diego is principally conducted at the South Bay Salt Works. This area, which includes the Pond 15 Site, contains approximately 1,068 acres and has produced salt for more than 130 years. The current operation uses solar evaporation in diked ponds to facilitate the concentration and precipitation of salt from San Diego Bay water (City of San Diego 2008). The approximately 90.90-acre Pond 15 Site is an active solar salt pond included within this operation.

3.5.7 Environmental Justice

This section describes communities in and around San Diego Bay and the project site, and their racial/economic composition. Minorities are defined as individuals who are members of one of the following population groups: Hispanic, African-American, American Indian or Alaskan Native, and Asian or Pacific Islander. Low-income populations are those exceeding the poverty threshold, or, as defined by the U.S. Department of Housing and Urban Development, low income is considered 80% of the median family income for a specific area, subject to adjustment for areas with unusually high or low incomes or housing costs.

The goal of environmental justice in the United States is to afford the same degree of protection from environmental and health hazards to all individuals and communities. Environmental justice is defined as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations, or the execution of federal, state, local, or tribal programs and policies. To achieve meaningful involvement requires that all potentially affected individuals have an appropriate opportunity to participate in decisions about proposed activities that could affect their environment and/or health, and that the concerns of all participants are considered in the decision-making process.

Data used to assess environmental justice considerations were obtained from the U.S. Census Bureau, Census 2010, which is the most complete and accurate source of demographic data and economic/income data available for the area. Data related to the census tract block groups that encompass the project site were used to compile information that could be used to distinguish minority and low-income populations.

The information provided in Table 3.5-6 shows the minority and low-income composition of communities surrounding San Diego Bay, specifically those located closest to the project site, and a comparison of those communities to the entire San Diego region and California. As shown in the table, the percentage of minorities in some of the communities surrounding the project site is higher than San Diego County as a whole.

Table 3.5-6
Minority Composition and Poverty Level Status (2010)

Jurisdiction	Total Population	Population Below Poverty Level	Below Poverty Level (%)	Minority* (%)	Median Income**
California	37,253,956	5,886,125	15.8%	37.6	$60,883
San Diego County	3,224,432	477,216	14.8%	28.4	$62,771
Imperial Beach (city)	28,680	6,080	21.2%	26.8	$52,148
Coronado (city)	23,916	1,459	6.1%	10.7	$85,985
National City (city)	57,799	12,485	21.6%	33.9	$38,849
Chula Vista (city)	237,595	19,958	8.4%	34.5	$66,955
San Diego (city)	1,376,173	239,454	17.4%	35.8	$61,118

Sources: SANDAG 2012; U.S. Census Bureau 2010.
* Minority aggregation includes the sum of Black, Asian, American Indian and Alaskan Native, Hawaiian and other Pacific Islander, some other race, and two or more races.
** Median household income in 2010 dollars, not adjusted for inflation.

The municipalities that encompass a greater percentage of racial minorities when compared to San Diego County as a whole include the City of San Diego, City of Chula Vista, and National City. However, all of these cities contain a lower proportion of racial minorities than that for California as a whole. National City, the City of Imperial Beach, and the City of San Diego have the highest percentage of people living below the poverty level at 21.6%, 21.2%, and 17.4%, respectively. These three cities also have a median household income below that of San Diego County as a whole at $38,849 for National City, $52,148 for Imperial Beach, and $61,118 for the City of San Diego.

The majority of the residences located in proximity to the project site are those located south of the Otay River Floodplain Site along Palm Avenue in the City of San Diego from 13th Street east and the City of Imperial Beach from 13th Street west. Residences in this area include mobile homes along Palm Avenue between 13th Street and Saturn Boulevard, and condominiums, single-family, or multi-family residential structures on 13th Street. There are also a few residences located on the west side of I-5 near the Pond 15 Site interspersed between commercial and industrial uses on Ada Street, Dorothy Street, and Stella Street.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter includes an evaluation of the environmental impacts associated with implementation of the three alternatives for the Otay River Estuary Restoration Project (ORERP), including the proposed action. In accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1508.7 and 1508.8), direct, indirect, and cumulative impacts of a Federal action must be addressed and considered by Federal agencies in satisfying the requirements of the National Environmental Policy Act (NEPA). Direct impacts are caused by an action and occur at the same time and place; indirect impacts are caused by an action later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density, or growth rate, and related impacts on air and water and other natural systems, including ecosystems. A cumulative impact is an impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Impacts include ecological (such as the impacts on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or health impacts, whether direct, indirect, or cumulative. As required by NEPA, this document identifies impacts that may be beneficial or adverse.

According to the CEQ regulations (40 CFR 1508.27), the significance of an action must be analyzed in several contexts, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. A significant impact may exist even if a Federal agency believes that, on balance, the impact would be beneficial.

The determination of a significant impact is a function of both context and intensity. Intensity refers to the severity of impact. To determine significance, the severity of the impact must be examined in terms of the type, quality, and sensitivity of the resource involved; the location of the proposed action; the duration of the impact (short or long term); and other considerations of context. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

NEPA requires an evaluation of the environmental consequences of each alternative. The discussion within this chapter includes the potential for environmental impacts of each of the alternatives including the proposed action, any significant environmental impacts that cannot be avoided should the proposal be implemented, the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the alternatives including the proposed action should they be implemented (40 CFR 1502.16). Determining how adverse an impact would be, for the purposes of NEPA, requires consideration of the "context and intensity" of the action (40 CFR 1508.27). The environmental consequence analysis may include significant adverse and/or beneficial impacts.

Analysis within this chapter of project-specific environmental impacts of the proposed action is intended to tier from the programmatic Environmental Impact Statement and Record of Decision for the *San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan*, prepared by the U.S. Fish and Wildlife Service (Service) in 2006 (USFWS 2006).

4.1 SIGNIFICANCE CRITERIA

This document includes analysis of the impacts, both adverse and beneficial, of implementing the proposed action and other alternatives, including short- and long-term impacts. The criteria outlined in this section provide the basis for determining whether implementation of the alternatives, including the proposed action, would result in a significant impact on the environment.

Topography and Visual Quality

An impact to topography or visual quality would be considered significant if grading would result in the substantial alteration of locally or regionally important topographic landforms. Additionally, an action that would block public views to a scenic resource (such as the San Diego Bay) from existing public vantage points would represent a significant visual impact.

Geology, Soils, and Agricultural Resources

Impacts related to geology and soils would be considered significant if activities related to the proposed action would trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion affecting on-site facilities such as levees, or adjacent facilities such as roadway and railway embankments and bridge abutments and pilings.

An impact to agricultural resources would be considered significant if an action would result in the conversion of a substantial area of land identified as Prime Farmland or Farmland of Statewide Importance to non-agricultural use.

Impacts to agricultural resources would be considered cumulatively significant if this action, in combination with other past, present, and reasonably foreseeable future actions, would result in the conversion of a substantial area of land identified by the State as Farmland of Local Importance to non-agricultural uses.

Mineral Resources

Impacts to mineral resources would be considered significant if a proposed action would result in the loss of the availability of a known mineral resource that would be of value to the region, such as by proposing incompatible uses on or in the vicinity (generally up to 1,300 feet) of an area classified as MRZ-2, on land classified as MRZ-3, on land underlain by Quaternary alluvium, or on or in the vicinity of areas known to contain industrial material and gemstone resources.

Paleontological Resources

Impacts to paleontological resources would be considered significant if a proposed action could directly or indirectly damage a unique paleontological resource or site, or if proposed grading or excavation would disturb the substratum or parent material in a paleontologically sensitive area.

Hydrology and Water Quality

Impacts related to the alteration of fluvial flows through a project site would be considered significant if grading or other actions within the floodplain would substantially increase the projected 100-year flood elevations upstream or downstream of the site, or would substantially alter flood flow velocities and associated erosional forces.

Impacts related to the alteration of tidal flows would be considered significant if projected tidal velocities following implementation of the proposed action would result in measurable scour of existing tidal channels or mudflats, or could jeopardize the stability of or increase the maintenance requirements for adjacent levees, levee breaches, bridge pilings, or other facilities.

Actions reasonably expected to result in violations of water quality standards or waste discharge requirements, substantial increase of downstream sedimentation, or introduction of contaminants (non-point-source pollution) into the watershed would result in a significant impact to water quality. Substantial changes in groundwater or surface water quality as a result of a proposed action would also be considered significant.

Cumulative impacts related to fluvial or tidal hydraulics would be considered significant if a proposed action, in combination with other actions within the vicinity, would increase the currently projected 100-year flood elevations upstream or downstream of the project site, or could increase flood flow or tidal velocities, resulting in measurable scour or erosion upstream or downstream of the project site.

Cumulative water quality impacts would be considered significant if a proposed action, in combination with other actions within the vicinity, would result in violations of water quality standards or waste discharge requirements, substantial increase of downstream sedimentation, or introduction of contaminants (non-point-source pollution) into the watershed.

Air Quality

Implementation of a proposed action would have a significant direct impact on air quality if the proposed action would result in emissions equal to or in excess of the standards outlined in Rule 1501 of the Air Pollution Control District's Rules and Regulations.

Implementation of a proposed action would have a significant direct impact on air quality if sensitive receptors are exposed to substantial pollutant concentrations, including air toxics such as diesel particulates, or if air contaminants are released beyond the boundaries of the project site. A significant increase in traffic congestion at nearby intersections due to actions associated with a proposed action would represent a significant indirect impact to air quality.

Cumulative impacts would be significant if the "de minimis" (minimum) thresholds developed by the U.S. Environmental Protection Agency for proposed Federal actions are exceeded in a non-attainment area, an area considered to have air quality worse than the National Ambient Air Quality Standards.

Noise

Noise generated by a proposed action that exceeds the affected city's noise standards at the project's property line would be considered a significant impact.

Cumulative noise impacts would be considered significant if the incremental increases in noise generated during construction of a proposed action, along with noise from other existing or anticipated actions in the area, would exceed accepted noise standards for any sensitive receptors in proximity to the project site.

Climate Change/Sea-Level Rise and Greenhouse Gases

The following factors were considered in addressing the impacts of climate change and sea-level rise: the potential impacts of the proposed action on climate change as indicated by its greenhouse gas (GHG) emissions, and the ways in which a changing climate over the life of a proposed action may alter the overall environmental implications of the proposed action. The potential significance of climate change and sea-level-rise impacts from and to the proposed action was assessed based on context and the intensity of the impacts.

Climate Change/Sea-Level Rise

The Service has not adopted guidance or developed a quantitative threshold for determining impacts of sea-level rise on a proposed action. The National Research Council's *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* contains sea-level-rise projections for California for three time periods over the coming century for areas located north and south of Cape Mendocino. The regional projections for areas south of Cape Mendocino indicate an increase in sea level of between 1.56 and 11.76 inches by 2030, and an increase of between 4.68 and 24 inches by 2050 (NRC 2012). For the purposes of assessing climate change/sea-level-rise impacts associated with the proposed action, an analysis was conducted to determine the effects of sea-level rise on vegetation communities and habitat quality under both a 4.68-inch and a 24-inch rise in sea level for the year 2050. This analysis is consistent with the guidance provided in the California Coastal Commission's adopted sea-level-rise policy guidance document (Commission 2015), which contains guiding principles for addressing sea-level rise in the coastal zone.

Greenhouse Gases

The Service has not developed a quantitative threshold for determining whether a proposed action's GHG emissions would have a significant impact on the environment. Therefore, significance of GHG emissions were analyzed under the CEQ guidance, which was developed to assist Federal lead agencies in analyzing the significance of an action's GHG emissions under NEPA. The CEQ guidance recommends a quantitative threshold of 25,000 metric tons of carbon dioxide equivalent (CO_2E) per year. The CEQ guidance states, "In considering when to disclose projected quantitative GHG emissions, CEQ is providing a reference point of 25,000 metric tons CO_2E emissions on an annual basis below which a GHG emissions quantitative analysis is not warranted…. This is an appropriate reference point that would allow agencies to focus their attention on proposed projects with potentially large GHG emissions" (CEQ 2014). In addition to the recommended CEQ quantitative threshold, the proposed action would be considered to have a significant impact for GHG emissions if it would be inconsistent with applicable regulations, plans, or policies for reducing GHG emissions.

The guidance provided in the California Environmental Quality Act Guidelines (14 CCR 15064.4(b)) includes factors that California lead agencies should consider when assessing the significance of impacts from GHG emissions on the environment. These factors include the extent to which a proposed action may increase or reduce GHG emissions compared to the existing environmental setting; whether the proposed action's emissions exceed a threshold of significance that the lead agency determines applies to the proposed action; and the extent to which the proposed action complies with regulations or requirements adopted to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. Impacts are considered significant if a proposed action would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the GHG emissions.

Contaminants

Impacts related to contaminants are considered significant when constituents of concern are present in or could be introduced into the soil, groundwater, or surface water at levels that exceed standard screening levels for assessing ecological risk.

Biological Resources

For this analysis, biological resources are broken into three separate categories: habitat and vegetation, wildlife and fisheries, and endangered and threatened species.

An impact to habitat and vegetation would be considered significant if the proposed action would result in substantial modification of existing habitat or vegetation in or surrounding the project site.

An impact to wildlife and fisheries would be considered significant if the proposed action would substantially change the amount or quality of available habitat to support one or more fish or wildlife species, substantially interfere with the movement of any native resident or migratory wildlife species, and/or result in a substantial change in the local population of one or more fish or wildlife species.

Any impact to endangered or threatened species; any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations; any species identified as a candidate, sensitive, or special-status species by the California Department of Fish and Wildlife, the Service, or the California Native Plant Society; or any avian species identified as a Bird of Conservation Concern would be considered significant if the action would substantially alter species presence, species reproductive success, species movement, or the availability of appropriate habitat to support such species.

Cultural Resources

An impact to cultural resources would be considered adverse if a resource listed in or eligible for listing in the National Register of Historic Places (NRHP) could be physically damaged or altered, isolated from the context associated with its listing, or affected by proposed action elements that would be out of character with the property or its setting. In addition, Title 36 of the Code of Federal Regulations, Part 800, defines impacts on historic resources as follows:

> <u>Section 8005.5(1) Criteria of Adverse Effects.</u> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a

> historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

Cumulative effects to cultural resources would occur if the proposed action, combined with other past, present, and reasonably foreseeable actions, would result in changes to a cultural resource listed in or eligible for listing in the NRHP, its landscape, or its setting that collectively could result in a loss of integrity.

Land Use

Impacts to land use would be considered significant if substantial changes in the use or the intensity of use could occur on the project site that would affect adjacent or nearby properties. A significant impact to land use would also occur if an action or the activities proposed in association with the action are inconsistent with applicable land use regulations (e.g., Coastal Zone Management Act of 1972, as amended; California Coastal Act).

Cumulative impacts would be considered significant if the incremental direct or indirect impacts of a proposed action, when added to other related actions, would substantially alter the use or intensity of uses within the area.

Traffic, Circulation, and Parking

Impacts related to traffic would be considered significant if project-related traffic would exceed accepted increases in roadway volume-to-capacity ratios as established by the affected jurisdictions, if road capacities would be exceeded, if sight distance provided at ingress/egress points is inadequate, or if the proposed action would substantially alter the demand for on- and/or off-street parking spaces.

Cumulative traffic impacts would be considered significant if traffic generated by the proposed action, combined with other past, present, and reasonably foreseeable actions, would result in substantial changes to current traffic volumes, congestion at major intersections, or changes in current roadway conditions.

Public Utilities/Easements

Direct or indirect impacts to public utilities and easements would be considered significant if implementation of the proposed action would have the potential to damage existing utilities, interrupt utility service, or modify access to existing utilities.

Cumulative impacts would be considered significant if the proposed action would have the potential to incrementally affect public utilities and easements in the general vicinity of the action.

Public Access and Recreational Opportunities

Impacts to public access, education, and recreational opportunities would be considered significant if substantial modification to existing public recreation and educational activities or opportunities would occur as a result of the proposed action, or if existing public access would be substantially altered.

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter public access and/or recreational opportunities.

Vectors and Odor

Impacts related to vectors and odor would be considered significant if the proposed action would have the potential to substantially alter wetland conditions conducive to mosquito breeding or to substantially alter the potential for odors to be generated from within the project site.

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter conditions that support mosquito breeding or odor generation.

Economics and Employment

Impacts to the regional economy would be considered significant if the proposed action could substantially alter existing employment levels within the local or regional economy, set a precedent for future development trends in the vicinity of the proposed action, or seriously interfere with daily operations on adjacent commercial and industrial properties.

Cumulative impacts would be considered significant if the proposed action would result in incremental direct or indirect impacts on economic or employment opportunities.

Environmental Justice

Impacts related to environmental justice would be considered significant if the proposed action would result in disproportionate human health impacts or environmental impacts to low-income or minority populations.

Cumulative environmental impacts would be considered significant if the action would result in incremental direct or indirect impacts to undiversified communities.

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4.2 PHYSICAL ENVIRONMENT

Topics addressed under the physical environment section include direct and indirect impacts associated with topography/visual quality; geology, soils, and agricultural resources; mineral resources; paleontological resources; hydrology and water quality; air quality; noise; climate change; greenhouse gas emissions; and contaminants. Analysis of each of these resource areas includes the project site, which is defined by two non-contiguous sites, the Otay River Floodplain Site and the Pond 15 Site. In addition, the analysis within this section includes the impacts associated with additional project features required for implementation of the Otay River Estuary Restoration Project (ORERP or proposed action), as outlined in Section 2.3.2, Features Common to Both Action Alternatives, of this environmental impact statement (EIS).

4.2.1 Topography/Visual Quality

This section describes the impacts of the proposed action on the existing topography and the existing visual character and quality of the southern San Diego Bay landscape, which includes the Western Salt Company Salt Works facility and the adjacent Otay River floodplain. Because the proposed action would include the introduction of new and/or raised vertical features~~ (i.e., new soil stockpiles displaying a height of not more than 8 feet and the raising of an approximately 1,400-foot segment of the existing levee between Ponds 22 and 23 by 2 feet),~~, the potential for blockage of existing views afforded to primary viewer groups in the area is also addressed in this section.

Significance Threshold: For purposes of this analysis, impacts to topography or visual quality would be considered significant if grading would result in the substantial alteration of locally or regionally important topographic landforms. Additionally, an action that would block public views to a scenic resource (such as San Diego Bay) from existing public vantage points would represent a significant visual impact.

As identified in the *San Diego Bay National Wildlife Refuge (NWR) Final Comprehensive Conservation Plan* (CCP) and EIS (USFWS 2006), the predominant topographic features on the current project site are limited to the relatively low levee system in the salt works and the flat upland topography of the Otay River floodplain. These features are not considered to have local or regional importance; however, the open, undeveloped nature of the area does contribute to the overall visual quality of this portion of the San Diego Bay (Bay).

Viewer Groups

Residents

Proposed excavation and wetland restoration activities on the Otay River Floodplain Site would be visible from existing residential development located to the west in the vicinity of 13th Street in Imperial Beach, as well as from a condominium development located to the southwest along the east side of 13th Street. Distant views of this restoration area are also available to some residents in the existing mobile home parks located to the south along Palm Avenue in the City of San Diego. Some residents across the Bay in the Coronado Cays also have distant views of the Pond 15 Site. For those residents with views of the eastern salt ponds, it would also be likely that some of the equipment needed to move excavated material from the Otay River Floodplain Site to the Pond 15 Site under the conveyor belt transport option would be visible. Because views from residences are private (and not public vantage points) and afforded to only those persons residing on a particular parcel/lot, the views of residents are not considered sensitive for the purposes of this analysis. Nevertheless, once the activities associated with implementing the proposed restoration action are completed, the area visible from these residences would remain open and undeveloped, resulting in no significant change in the quality of their views.

Motorists

Long, wide, and generally unencumbered views of the Otay River Floodplain Site and the eastern salt ponds are available to local motorists traveling along 13th Street, and distant views of the salt ponds are available to motorists traveling along the west of side the Bay on State Route 75.

Glimpses of San Diego Bay, the salt ponds, and in some cases the Pond 15 Site are also available to passing motorists on portions of Bay Boulevard and Palomar Street at Bay Boulevard. Limited views of the Otay River Floodplain Site are also available from the southbound lanes of Interstate 5 (I-5). These views are somewhat obscured by existing vegetation present along the freeway and on the adjacent restored floodplain.

Cyclists

An approximately 1.1-mile-long off-street segment of the Bayshore Bikeway traverses the project site. At the West Frontage Road/Main Street intersection, the bikeway transitions from an on-street bicycle route to an off-street bicycle path and turns west toward the salt works complex and San Diego Bay. This segment of the paved bike path is lined by 6-foot-tall black chain-link fencing (chain-link fencing is replaced by 6-foot-tall orange-brown bridge railing at river crossings) and is situated atop a mounded levee that extends along the north side of the Otay River channel, providing views of the salt ponds to the north and the Otay River Floodplain Site to the south.

Another bike path, which travels north/south between the northern terminus of Saturn Boulevard to the south and Main Street to the north, is located to the east of the Otay River Floodplain Site. Bicyclists along the route have views of the restoration site that are obscured in some locations by riparian vegetation.

Trail-Based Recreationists

An unpaved hike/bike path is located to the east of the Otay River Floodplain Site and provides connectivity between the Otay Valley Regional Park (OVRP) staging areas located west and east of I-5. The existing trail alignment provides trail-based north/south connectivity between the Saturn Boulevard and Main Street OVRP staging areas, as well as east/west connectivity between these staging areas and the Hollister Street OVRP staging area located east of I-5 near Hollister Pond and Louret Avenue (OVRP 2015). In addition, the hike/bike path connects to the existing alignment of the Bayshore Bikeway at the western terminus of Main Street. These trail-based recreationists (e.g., hikers, walkers, runners) are also considered viewer groups because they are currently afforded views of the Otay River Floodplain Site. Due to the density, height, and spread of riparian shrubs on the River Partners Restoration site, views to the salt works complex and San Diego Bay are generally not available to trail-based recreationists on the OVRP hike/bike path.

4.2.1.1 Alternative A

Under this alternative, no grading operations would occur, and there would be no alteration of the existing landform. Annual maintenance and habitat management activities for the San Diego Bay NWR would continue to occur, including mowing portions of the Otay River floodplain to reduce the threat of wildfire and the spread of invasive plant species. Views of the project site from the surrounding area would remain unchanged from the existing condition. No activities would occur that could block views of the site or across the site to significant scenic resources such as San Diego Bay. Since no grading operations, alterations to existing landforms, or other landscape-modifying activities would occur, no significant impacts to topography or visual quality are anticipated under this alternative. Additionally, this alternative would not result in the substantial alteration of any locally or regionally important topographic landforms or block public views to a scenic resource from existing public vantage points.

Although no grading or other landform alteration is proposed under this alternative, the project site is included in the area proposed for restoration in the programmatic CCP and EIS for the San Diego Bay NWR. Therefore, alteration of the floodplain could occur at some time in the future even under the no action alternative. However, before implementation of such a project, environmental analysis conducted in accordance with the National Environmental Policy Act (NEPA) would be required.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.1.2 Alternative B

Restoration Sites

While San Diego Bay is a scenic resource, no locally or regionally important topographic landforms exist within the project boundary or in the immediate vicinity of the project site. Under this alternative, both the Otay River Floodplain Site and the Pond 15 Site would be modified to restore tidally influenced wetlands communities. To achieve these habitat changes, approximately 320,000 cubic yards of material would be excavated from a 33.51-acre area located on the Otay River Floodplain Site west of Nestor Creek. Following excavation, this area would be contour graded to the desired elevations within the restoration footprint.

The Pond 15 Site, the receiving site for the majority of the excavated material from the Otay River Floodplain Site, would also be graded and contoured to elevations suitable for supporting the proposed range of coastal wetland habitat types. In addition to filling the site to raise the elevations in the pond, once the material in the pond is adequately compacted, an approximately 200-foot-long segment of the outer levee in the northwestern perimeter of the pond would be breached to connect the pond to the Bay and establish routine tidal exchange within Pond 15.

The excavation proposed for the Otay River Floodplain Site and grading and filling proposed in the Pond 15 Site under Alternative B would result in minor changes to existing topography. The approximately 30-acre floodplain site would be excavated and as a result would display a visual character dissimilar from that of existing conditions during construction activities. The existing site consists primarily of former salt pond bottom and borrow areas, pockets of *Isocoma* scrub vegetation lacking diversity, and disturbed land. As a result, the floodplain site displays relatively low visual quality. Grading techniques to achieve varying elevations in the restored wetland and adjacent upland areas would be employed and are intended to mimic the natural topography of similar systems and wetland/upland transitions in the area. Similar grading techniques would be used following the filling of the Pond 15 Site. Once construction is complete and the restoration sites begin to revegetate, the Otay River Floodplain Site and Pond 15 Site would begin to appear and be experienced by local viewer groups as cohesive, natural elements of the larger San Diego Bay landscape.

Therefore, while the current visual quality and character of the project site would be altered as a result of construction activities, no views would be blocked, and implementation of the restoration plan for the project site would enhance the site's quality and character by increasing vegetative diversity and reintroducing subtidal, intertidal mudflat, and intertidal coastal salt marsh habit and systems to the landscape. Therefore, any impacts to topography or visual quality following the restoration of the project site would be less than significant.

Regarding the Pond 15 Site, due to distance and the presence of intervening vertical elements (i.e., vegetation and existing structures), the existing Pond 15 levees are not readily visible from outside the salt pond complex; therefore, proposed levee modifications would not substantially affect existing visual quality and would not block views of San Diego Bay from a public vantage point. Therefore, visual impacts due to levee modifications associated with Pond 15 restoration would be less than significant.

Construction Access between Restoration Sites

To allow for construction access to and between the two restoration sites, temporary crossings are proposed at Nestor Creek and the Otay River in the Otay River Floodplain Site and at the Palomar channel near the Pond 15 Site, as shown in Figure 2-1a, Project Features. In addition, temporary construction access roads would be constructed for the Otay River Floodplain Site between Nestor Creek and Main Street, and for the Pond 15 Site between Bay Boulevard and Pond 15, as shown in Figure 2-2, Truck Haul Route. The southern crossing at Nestor Creek, the construction access road, and construction staging areas would all be visible to cyclists on the Bayshore Bikeway and to some extent to trail-based recreationists on the OVRP trails to the east, but are not likely to be visible from any other public view points. The Palomar channel crossing may be visible from the on-street, Bay Boulevard segment of Bayshore Bikeway, public roadways, and local businesses within the general vicinity.

The temporary construction road and the crossing at the Palomar channel would occur in an existing industrial area composed of the salt works complex, one- to three-story office and commercial buildings, and vacant lots. Due to the ground-level location of the Palomar channel crossing and the presence of existing vertical features—including advertising signage, mature eucalyptus and palm trees near the western terminus of Palomar Street, and mature, spreading landscape trees installed around the two- to three-story concrete masonry unit Grainger Industrial Supply building at 1150 Bay Boulevard—visibility of the construction road and channel crossing from Palomar Street, Bay Boulevard, and the Bayshore Bikeway is limited. Also, motorists and cyclists are mobile viewers and experience the surrounding landscape in temporary fashion as they pass through a given area. Therefore, at locations where views of the construction road and channel crossing would be available, viewers would not be able to visually fixate on these subtle, temporary changes to the larger San Diego Bay landscape. Furthermore, at the completion of construction, the landform would be restored to pre-project conditions and revegetated with the appropriate native vegetation, avoiding any long-term changes to the topography or visual appearance of the area.

Material Transport Options

The proposal includes ~~three~~two options for transporting the material excavated from the western portion of the Otay River Floodplain Site to the Pond 15 Site. The first option involves using haul trucks to bring excavated material to the Pond 15 Site. The truck haul route would use the same construction access routes and temporary crossings described above for general construction access to the sites. It would also require the use of public streets, as presented in Figure 2-2. Haul trucks would be active on these streets almost continuously for 8 hours during scheduled work days. Although an influx of haul trucks would alter the existing visual quality of views by introducing motion and new vertical and rectangular features that could affect the availability of long, wide views of the San Diego Bay from the southernmost segment of West Frontage Road and segments of Bay Boulevard between L Street and Anita Street, effects would be temporary and would not involve permanent, long-term visual change to the existing landscape. In addition, haul trucks would not remain stationary in a single location along haul routes for substantial amount of time. Furthermore, viewer groups that would experience altered views during haul truck operations (i.e., motorists and cyclists) would also be mobile; therefore, potential view blockage that may occur as a result of haul truck traffic in the area would be short and experienced briefly. Therefore, due to the temporary and mobile nature of haul truck trips and the lack of long-term permanent visual change that would occur as a result of haul truck trips the project area, impacts to visual quality and existing views of the San Diego Bay associated with haul truck trips would be less than significant.

The second transport method would involve the use of conveyor belts to transport excavated material from one portion of the site to another. Conveyor belts may be used to move excavated material within the Otay River Floodplain Site part of the distance between the Otay River Floodplain Site and the Pond Site 15, or all the way between the two sites. In the case in which the conveyor belt would extend from the Otay River Floodplain Site to the salt works, the belt would be installed over the Otay River and under the Bayshore Bikeway and would then continue northward using the existing levees for support. Within the salt works, the conveyor belt could be placed in one of two potential alignments as shown on Figure 2-4, Conveyor Belt Haul Routes. Due to the anticipated low vertical profile of the conveyor belt, this delivery method is not anticipated to be readily visible to trail-based recreationists or motorists traveling in the vicinity of the project site. The system would be visible to Bayshore Bikeway cyclists traveling between Ponds 10 and 48, but would not obscure views of the salt ponds and Bay.

While there may be specific locations from Frontage Road and Bay Boulevard where viewing conditions allow for enhanced visibility to the conveyor belt alignment, the system would be located beyond multiple salt ponds and several levees and would not be visually prominent or overly discernible to mobile viewers. Furthermore, because the viewshed in the immediate vicinity of the potential conveyor belt system is not pristine (i.e., the landscape primarily consists of salt ponds actively used for commercial purposes to produce and extract salt), the inclusion of the conveyor belt system in available views would not represent a significant adverse effect on the overall visual quality of the area. The conveyor belt would be removed at the completion of construction activities, and the landform where it was installed would be restored to pre-project conditions. As a result, impacts to the existing visual quality of the San Diego Bay landscape associated with the temporary operation of the conveyor belt system would be less than significant.

~~The third option for material transport would be a pipeline used to move the material once it has been mixed with water from the Otay River to create a slurry. Two potential alignments are proposed for the slurry pipeline option (see Figure 2-5, Pipeline Haul Routes). After being extended over the Otay River and under the existing Bayshore Bikeway alignment crossing to the salt works complex, the pipeline would extend north either along existing levees or by being floated in the existing salt ponds. The pipeline would be present in the area for 2 years. The potential effects to the visual quality in the area and potential for view blockage would be similar to those described above for the conveyor belt system; however, a pipeline located just above the ground or on the surface of the ponds would be less visible from adjacent areas than a conveyor belt.~~

Although each of these ~~three~~two material transport methods (i.e., conveyor belt~~, pipeline,~~ and presence of trucks on the project site) would temporarily alter the existing visual quality in the general vicinity of the project for a period of 2 years, none of the methods would substantially block public views of San Diego Bay. Therefore, impacts associated with transportation of the material between the Otay River Floodplain Site and the Pond 15 Site would not represent a significant visual impact.

Levee Modifications and Channel Protection

In addition to project construction features that would be implemented to facilitate the distribution of material between the two sites, additional project features would be implemented, as outlined in Section 2.3.2. An approximately 1,400-foot-long segment of the existing levee between Ponds 22 and 23 would be raised by 2 feet, the existing levee along the southern bank of the Otay River would be removed, and a new levee would be constructed along the southern edge of the restored wetland. In addition, slope armoring (e.g., a 1-foot layer of 5-inch (D50) rock) ~~extending~~ measuring up to approximately 1,100 feet long and approximately 60 feet wide ~~is proposed~~ may be required along the southern slope of the Bayshore Bikeway in the vicinity of Pond 48 to address ~~increases in~~ the potential for erosion should flood ~~flow~~ velocities ~~in the river channel under~~ exceed 0.6 ft/s. The need for this ~~alternative~~ feature (PF 2) will be further reviewed during final engineering.

Raising a 1,400-foot segment of the earthen levee separating Ponds 22 and 23 an additional 2 feet would not result in substantial view blockage or substantially affect the existing visual quality of the San Diego Bay landscape. Public vantage points in the vicinity of the levee consist of the Bayshore Bikeway and the system of pedestrian paths located north of the bikeway alignment and south of Pond 22. On the Otay River floodplain, segments of the Bayshore Bikeway are located at an elevation similar to that of the existing levee; however, substantial view blockage of the San Diego Bay would not occur because any change in view would last for only a short time as the bicyclist or pedestrian travels along the path. After crossing the Otay River Bridge, the elevation of the bikeway increases and cyclists and pedestrians are situated approximately 7 to 10 feet above the elevation of the levee. From these elevated locations, raising the levee an additional 2 feet would not encumber existing views, and viewers would continue to be afforded wide and long views of the San Diego Bay and more distant scenic features.

Because removal of the existing levee along the northern boundary of the Otay River Floodplain Site would effectively remove an existing vertical feature (and potential view blockage element) from the landscape, levee removal would not result in blockage of existing San Diego Bay views in the surrounding area. Also, because the new levee to be constructed along the southern edge of the restored wetland would be constructed at an elevation lower than that of surrounding public vantage points, construction of the levee would not create substantial blockage of existing views from public vantage points in the surrounding area. Additionally, because the floodplain restoration site is currently a mounded and bermed landform, reintroduction of a mounded, bermed landform along the site's southern boundary would not substantially alter the existing quality of the visible landscape.

~~Slope~~ If slope armoring is required along approximately 1,100 feet of the northern slope of the Otay River channel, it would be visible from the Bayshore Bikeway. This 1,100-foot-long, 60-foot-wide area would include a 1-foot layer of 5-inch (D50) rock to be introduced along the unvegetated and partially screened portion of the existing descending slope located north of the existing bikeway alignment. The installation of this project feature, although obscured from view from all but users on the Bayshore Bikeway, would alter the current visual quality of the area. No views would be blocked; however, the presence of this rock over a large portion of the salt pond levee would represent a visually prominent project feature. To minimize the effect of this feature on views from the Bayshore Bikeway should it be deemed necessary, Mitigation Measure (MM) VIS-1 is provided (see Mitigation Measures in this section). Following implementation of MM-VIS-1, visual impacts associated with this feature would be reduced to less than significant.

~~Stockpiles~~

~~Material excavated from the western portion of the Otay River Floodplain Site that is not needed for restoration or the implementation of project features would be stored on the Otay River Floodplain Site in two stockpiles for use on future San Diego Bay NWR projects. The stockpiles, which would be approximately 8 feet in height, would remain on the site for an unspecified period of time.~~

~~The two stockpiles, which would each measure about 500 feet long by 200 feet wide and display a height of no greater than 8 feet (as illustrated in Figure 2-3b, Proposed Stockpiles Details), would be visible from the Bayshore Bikeway. In addition, the stockpiles may be visible from the OVRP hike/bike path trails and residential development to the south. Views of the stockpiles from the southbound travel lanes of I-5 to the east would likely be obscured by the trees and shrubs present between I-5 and the project site.~~

~~Although the proposed stockpiles would be located on uplands previously disturbed by agricultural and municipal activities, the bulk and height of the mounds would not be consistent with the surrounding, relatively flat natural topography of the Otay River floodplain, thereby altering the existing topographic character of the site. However, once the soil is removed for other purposes, the topographic character of the site would be restored. Because the topographic character of the area would be restored in the future, no significant irreversible change to the site topography would result; therefore, the primary issue associated with the presence of these mounds is visual quality.~~

~~If left as unvegetated semi-rectangular mounds of dirt, these stockpiles would adversely affect the visual quality of the area; therefore, to minimize the visual effect of the stockpiles and improve their overall appearance within the landscape, the top and side slopes of the mounds would be hydroseeded with appropriate native vegetation. The establishment of native vegetation and associated root systems would also ensure soil stability.~~

~~The proposal to align the stockpiles in an east/west orientation would ensure minimal blockage of distant views of San Diego Bay from the OVRP trails and I-5. Furthermore, because the piles would be located to the south of the Bayshore Bikeway, they would not block public views of the San Diego Bay available to Bikeway cyclists and pedestrians. While the mounds would be visible in the southerly view of Bikeway users, this view would be softened once the proposed native vegetation is established. Additionally, no recognized scenic resources are present to the south that would be blocked from view by the mounds. Although excavation and grading associated with the restoration of tidally influenced wetland habitats within the Otay River Floodplain Site and Pond 15 Site, as proposed in Alternative B, would not result in any significant adverse effects related to topography or visual quality, the placement of excess material from this excavation~~

~~into two stockpiles on the Otay River Floodplain Site would introduce inconsistent landforms to the Otay River Floodplain Site. Therefore, MM-VIS-1 has been incorporated into the scope of the project to reduce the visual effects of these stockpiles to below a level of significance.~~

Mitigation Measures

MM-VIS-1: ~~A~~Should slope armoring along the Otay River channel be deemed necessary, a revegetation plan ~~for the implementation~~ and accompanying monitoring plan to address the establishment of vegetative screening ~~adjacent to the Otay channel protection project feature (if implemented), and revegetation of on-site stockpiles~~ for the affected area shall be approved by the U.S. Fish and Wildlife Service (Service) and the Executive Director of the California Coastal Commission (Commission) prior to the initiation of ~~any grading in either~~the project~~ site~~. The revegetation plan shall be prepared by a qualified restoration specialist and shall identify the proposed plantings, hydroseed mix, and applicable treatment, monitoring, and success criteria~~ for both areas.~~. The revegetation plan shall include the following requirements~~ for each location~~:

~~***Otay channel protection vegetative screening***: ~~Following installation of the Otay channel protection (if required) as proposed adjacent to the Bayshore Bikeway and Pond 48 (Project Feature 2, as shown on Figure 2-1a of the EIS), low shrub vegetation shall be installed to enhance existing visual screening of the Otay channel. Vegetative screening shall be implemented on the south side of the fence line along the Bayshore Bikeway where channel armoring is visible to cyclists utilizing the Bikeway. Planting of low shrub vegetation shall only be required where existing vegetation does not adequately screen views of the proposed armoring for Otay channel protection project feature. Plant material to be installed and planting density/spacing shall be consistent with existing vegetation located on the south side of Bikeway-adjacent fencing, or as adequate to screen views of the project feature.

~~***Stockpile vegetation***: Immediately upon completion of all material transport activities from the Otay River Floodplain Site, all necessary grading and compaction of the two stockpiles shall be completed and an appropriate hydroseed mix shall be applied to the top and slopes of the stockpiles.~~

The Otay Channel Protection area~~ and stockpile revegetation efforts~~ shall be monitored and maintained during the establishment of the vegetation to control weeds and ensure that ~~both sites are~~ the site is meeting applicable success criteria ~~identified in the revegetation plan for vegetative cover~~. If necessary to meet these success criteria, additional hydroseeding and/or plantings shall be conducted and/or adaptive management measures shall be implemented as needed until the Otay Channel Protection area vegetative screening area ~~and stockpiles are~~is adequately vegetated~~. Each location~~ (see Appendix D). The revegetated area shall continue to be monitored and maintained for a period of 5 years after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring. Monitoring reports shall be submitted to the Service annually to detail the progress towards achieving the required species and vegetation coverage. Once the approved success criteria have been met, a final report shall be submitted to the Service and the Commission to document completion in accordance with the approved revegetation plan.

4.2.1.3 Alternative C

With the exception of total excavated materials from the Otay River Floodplain Site and associated truck trips required to export the materials to locations within the project area, Alternative B and Alternative C include similar project features. Therefore, implementation of Alternative B or Alternative C would likely result in similar visual change to the existing San Diego Bay landscape.

Under Alternative C, both the Otay River Floodplain Site and Pond 15 Site would be restored to tidally influenced wetland communities similar to those described under Alternative B. However, Alternative C would also include subtidal wetland habitat at completion of construction, as described in Section 2.3.5, Comparison of Alternatives. To achieve this additional subtidal habitat, the portion of the Otay River Floodplain Site located to the west of Nestor Creek would be excavated to remove approximately 370,000 cubic yards of material, approximately 50,000 cubic yards more than Alternative B. Following excavation, the portion of the Otay River Floodplain Site west of Nestor Creek would be contour graded to achieve the desired elevations within the restoration footprint and graded to mimic adjacent topography and landform.

The ~~three~~two options for material transport proposed to facilitate the redistribution of material between the western portion of the Otay River Floodplain Site and the Pond 15 Site are also applicable to restoration under this alternative. The same levee modifications and project features outlined for Alternative B would be implemented under this alternative, resulting in similar impacts to visual quality as analyzed in detail above. Should the implementation of Alternative C require the installation of a rock revetment along Pond 48, as described under Alternative B, visual impacts would be mitigated through the implementation of MM-VIS-1. ~~To minimize the visual impact related to the proposed rock revetment along Pond 48, MM-VIS-1, described under Alternative B, would be incorporated into the scope of the project if Alternative C is implemented.~~

Similar to implementation of Alternative B, implementation of the restoration proposals included in Alternative C would not result in the substantial alteration of the topography or visual quality of the area. ~~However, Alternative C also includes a proposal to stockpile excess material on the Otay River Floodplain Site, with the dimensions of the stockpiles identical to those described under Alternative B. Consistent with the analysis and conclusions presented under Alternative B, the placement of these stockpiles on the Otay River floodplain under Alternative C would alter the visual quality of the area. As a result, MM-VIS-1 would be incorporated into the scope of the project to reduce the visual effects of these stockpiles to below a level of significance.~~

Mitigation Measures

MM-VIS-1, as outlined for Alternative B, would also be implemented for this alternative. With the implementation of this measure, no significant impacts related to topography or visual quality are anticipated.

4.2.2 Geology, Soils, and Agricultural Resources

This section analyzes the potential impacts related to geology, soils, and agricultural resources that would result from the implementation of each of the three proposed alternatives. The susceptibility and/or contribution of the alternatives are described in terms of their potential direct or indirect impact on the public. The following five technical reports were prepared for this project and applicable information was included in this analysis:

- *Limited Site Assessment for MKEG Property – Palm City Saturn Boulevard (19th Street)*, prepared by GEOCON in April 1989
- *Sediment Characterization Sampling and Analysis Report South San Diego Salt Ponds 12,13,14,15*, prepared by Anchor QEA in April 2014 (provided as Appendix F1)
- *Sampling and Analysis Report Otay River Estuary Restoration Program Soil Characterization Program*, prepared by Anchor QEA in March 2013 (provided as Appendix F2)

The conclusions from each of these reports are incorporated into the discussion below.

4.2.2.1 Geology and Soils

Significance Threshold: Impacts related to geology and soils would be considered significant if project-related actions would trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion affecting on-site facilities, such as levees, or adjacent facilities, such as roadway and railway embankments and bridge abutments and pilings.

4.2.2.1.1 Alternative A

Under this alternative, no grading operations would occur on either project site; instead, annual San Diego Bay NWR maintenance and habitat management activities would continue as in the existing condition. Although no additional actions are proposed under this alternative, as described in Section 3.2.2, the existing condition the Otay River Floodplain Site is at risk for liquefaction and settlement due to existing soil and groundwater conditions in the area. This alternative would not alleviate these hazards, and the Pond 15 Site and project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a would continue to be at risk for inundation should an offshore earthquake cause a tsunami. However, no actions are proposed that would trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.2.1.2 Alternative B

As described previously, the project sites are underlain with soils and groundwater conditions that put these areas at risk for impacts related to seismic ground shaking, seismically induced liquefaction, and settlement. The Pond 15 Site and project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a are also susceptible to inundation from a tsunami in the event of a large magnitude earthquake. Implementation of this alternative would not increase the risk of these geologic hazards at the project sites. Additionally, Alternative B does not include placing structures or people in an area susceptible to these hazards. Therefore, this alternative would not result in significant impacts related to geologic hazards.

Under this alternative, the project sites would be reconfigured to achieve ground elevations appropriate for supporting tidally influenced wetland vegetation. Excavation on the Otay River Floodplain Site, on the Pond 15 Site, and at other sites where project features are proposed would expose soils that could lead to increased risk for slope, levee, and/or riverbank failure and increased erosion. Construction vehicle movement along and adjacent to levees could also result in soil instability. Finally, there is the potential for compaction of the underlying soils in Pond 15 due to the weight of the soils that would be added to the area to achieve elevations in the pond that would support intertidal habitats.

The construction plans for Alternative B have been designed to address the potential for such effects. For example, levees within the salt pond operation that would be needed for construction access would be improved and widened as necessary to ensure the continued integrity of the roadbed and associated slopes. Levees around Pond 15 would be reinforced before dewatering to ensure soil stability during construction, as well as once tidal influence is restored to the pond. Fill quantities proposed for Pond 15 have been determined after taking into consideration the potential for some compaction of the underlying soils, and where creek channels must be crossed for construction access, the crossings have been designed to ensure the integrity of the channel banks. Temporary erosion control measures would also be implemented during construction to minimize the potential for soil instability in areas disturbed by project activity during significant rain events and permanent features proposed to ensure long-term slope stability include appropriate slope gradients and establishment of suitable vegetation on newly constructed slopes. Similar measures would be implemented to ensure the stability of the new levee to be constructed along the southern edge of the Otay River Floodplain Site.

~~The slopes of the two stockpiles that would be created as part of the project would also be at risk for slope failure and erosion. To minimize the potential for such impacts, the slopes would be compacted and maintained at a slope gradient of 4:1 or flatter. Temporary erosion control measures would be implemented while the stockpiles are being created and more permanent measures would be implemented upon project completion, as described in Section 2.3.2. Similar measures would be implemented to ensure the stability of the new levee to be constructed along the southern edge of the Otay River Floodplain Site.~~

Once construction is complete, a small amount of sedimentation would be natural and is anticipated to occur on the project site. All slopes would be compacted at a gradient of 3:1 or flatter and all but one would be vegetated with native plants to protect and reinforce the underlying soils. The gradient of the slopes on the relocated levee along the southern boundary of the Otay River Floodplain Site and the levee to be raised between Ponds 22 and 23 would be 3:1. The relocated levee would be revegetated with appropriate native plants, but successfully vegetating the levee between Ponds 22 and 23 would be difficult due to the high salinity levels in the adjacent ponds. Erosion control measures would be retained in place at this location until the slopes are determined to be stable. Adherence to these design standards would minimize the potential for slope failure and excessive sedimentation. To reduce the potential for erosion and to minimize forces that could impact slope stability during and after construction, MM-GEO-1 has been incorporated into the scope of Alternative B. ~~To ensure the long-term stability of soil stockpiles to be placed on the Otay River Floodplain Site east of Nestor Creek, measures described in MM-GEO-2 have been incorporated into the scope of the project under Alternative B.~~ The implementation of MM-GEO-1 and MM-GEO-2 would reduce the potential for significant adverse effects related to soil erosion and slope instability to below a level of significance. An analysis of the potential for increased erosion from water and wind as a result of implementation of Alternative B is addressed in Section 4.2.5, Hydrology and Water Quality, of this EIS.

Mitigation Measures

To avoid or minimize significant impacts from site grading related to slope instability, subsidence, ground failure, or erosion, the following measures have been incorporated into the scope of the project:

MM-GEO-1 A project-specific stormwater pollution prevention plan (SWPPP) shall be prepared and approved by the U.S. Fish and Wildlife Service (Service) and the Regional Water Quality Control Board before the start of construction. The SWPPP shall be implemented by the contractor throughout the duration of construction, including while construction activities are temporarily halted during the core nesting season. The best management practices (BMPs) contained in the SWPPP shall include, but are not limited to, silt fences, fiber rolls, gravel bags, and soil stabilization measures such as erosion control mats and hydroseeding to prevent soil erosion and sedimentation during wind and rain events. Implementation of these BMPs as delineated in the SWPPP shall apply to all areas proposed for excavation. Structural BMPs (or suites of BMPs) shall be designed to treat, infiltrate or filter the amount of stormwater runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs. The SWPPP shall also include a schedule and protocols for inspection, cleaning and repairing of BMPs. The Service is responsible for ensuring that the contractor implements and maintains the BMPs identified in the SWPPP.

MM-GEO-2 To ensure the long-term stability of all slopes created within the project site, a post-construction erosion control plan shall be prepared by a registered professional engineer or certified hydrogeologist and approved by the Service prior to the commencement of grading. A map or graphic shall be included in the erosion control plan identifying the locations and specific erosion and sedimentation control measures to be implemented. As part of the erosion control plan, the contractor shall be required to confirm that slope gradients are constructed as designed, all post-construction erosion control measures are in place, and the slopes are planted or seeded immediately upon completion of construction activities consistent with the revegetation plan as identified in MM-VIS-1.

Planting and/or seeding of slopes ~~and stockpiled material~~ shall be monitored and maintained during establishment of the vegetation to ensure that vegetative cover, as determined by a qualified restoration specialist, is achieved as specified in the revegetation plan identified in MM-VIS-1.

~~In addition to stockpile hydroseeding and establishment of vegetative cover, the following measures shall be implemented, as deemed necessary by a registered professional engineer or certified hydrogeologist, as part of the erosion control plan, to prevent erosion of stockpiled material:~~

- ~~Topographic controls such as contouring and terracing shall be implemented, if necessary, to limit scouring resulting from steeply sloped piles during large rain events.~~
- ~~A trench or drainage channel overlain by rock check dams shall be installed at the base of the stockpiles to divert stormflow away from adjacent wetland areas and treat stormwater runoff during large rain events.~~
- ~~Biodegradable wattles and erosion control blankets shall be installed over the stockpiles until vegetative cover is sufficiently established. Wattles and/or blankets would not need to be removed following vegetative establishment.~~

~~The stockpiles shall continue to be monitored and physically maintained in perpetuity after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring, and that all required runoff control measures are operating effectively to the satisfaction of the registered professional engineer or certified hydrogeologist. Poseidon would be responsible for long-term monitoring and maintenance of the stockpiles until their eventual deconstruction.~~

4.2.2.1.3 Alternative C

Impacts to geology and soils associated with Alternative C would be similar to those outlined for Alternative B in Section 4.2.2.1.2. Under this alternative, approximately 50,000 cubic yards of additional material would be excavated from the Otay River Floodplain Site west of Nestor Creek and transported to the Pond 15 Site. This increase in excavation would not, however, represent an increased potential for erosion or slope instability.

As with Alternative B, there is the potential for seismic hazards in the project area, including ground shaking, liquefaction, settlement, and tsunami (as stated previously, the Pond 15 Site and project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a are located within the tsunami inundation zone (CalEMA 2009)). The risk of these geologic hazards occurring at the project site would not increase as a result of implementation of Alternative C. Additionally, the proposed action does not include placing structures or people in an area susceptible to these hazards. Therefore, this alternative would not result in significant impacts related to geologic hazards. As described for Alternative B, excavation on the Otay River Floodplain Site, on the Pond 15 Site, and at other sites where project construction features are proposed would expose soils that could lead to increased risk for slope, levee, and/or riverbank failure and increased erosion, and as with Alternative B, the construction plans for Alternative C have been designed to address the potential for such effects. Temporary erosional control measures would be implemented to ensure slope stability and following the completion of construction, slopes created on the Otay River floodplain would be vegetated with native species that would enhance slope stability.

Similarly to Alternative B, erosion and slope stability may be impacted during construction~~ and through the implementation of soil stockpiles on the Otay River Floodplain Site east of Nestor Creek.~~. MM-GEO-1 and MM-GEO-2 would be implemented for Alternative C. The implementation of these measures would reduce the potential for significant adverse effects related to soil instability to below a level of significance.

Mitigation Measures

MM-GEO-1 and MM-GEO-2, as outlined for Alternative B, would also be implemented under Alternative C. With the implementation of these measures, no significant impacts are anticipated.

4.2.2.2 Agricultural Resources

Significance Threshold: An impact to agricultural resources would be considered significant if an action would result in the conversion of a substantial area of land identified as Prime Farmland or Farmland of Statewide Importance to nonagricultural use.

4.2.2.2.1 Alternative A

Although approximately 35.6 acres of the Otay River Floodplain Site are designated as Farmland of Local Importance on the California Department of Conservation, San Diego County Important Farmlands 2010 Map (California Department of Conservation 2013a), this area has not been used for agricultural purposes since 1988. Alternative A does not propose any change to the existing land use and would therefore have no potential to convert land identified as Farmland of Statewide Importance (California Department of Conservation 2013b) to nonagricultural use. As a result, the implementation of Alternative A would have no impact on agricultural resources.

Mitigation Measures

No impacts on agricultural resources are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.2.2.2 Alternative B

As discussed in Section 3.2.2, Geology, Soils, and Agricultural Resources, of this EIS, the western portion of the Otay River Floodplain Site is designated as Other Land, and 35.6 acres of the eastern portion of the Otay River Floodplain Site, including land proposed for implementation of project features, is designated as Farmland of Local Importance on the California Department of Conservation, San Diego County Important Farmlands 2010 Map (California Department of Conservation 2013a). This alternative involves restoration of approximately 33.51 acres of coastal wetlands within the Otay River Floodplain Site, all on land designated as Other Land. The 90.90 acres within the Pond 15 Site is also designated as Other Lands on the San Diego County Important Farmlands 2010 Map.

The area designated as Farmland of Local Importance east of the Otay River Floodplain Site would not be permanently affected under this alternative. There would be short-term construction-related impacts to this area, including construction staging~~ and the stockpiling of excess material from the Otay River Floodplain Site~~, as shown on Figure 2-1a~~. Although stockpiled material would remain on the eastern portion of Nestor Creek~~, but after the completion of construction, the underlying soils would not be significantly impacted.

Therefore, the proposed action would not result in the loss of soils identified as supporting Farmland of Local Importance, and a substantial area of land with this designation would not be converted to nonagricultural use. No significant impacts related to agricultural resources would occur under Alternative B.

Mitigation Measures

No significant impacts to agricultural resources are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.2.2.3 Alternative C

The potential impacts to agricultural resources from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

No significant impacts to agricultural resources are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.3 Mineral Resources

Significance Threshold: Impacts to mineral resources would be considered significant if a proposed action resulted in the loss of the availability of a known mineral resource that would be of value to the region, such as proposing incompatible uses on or in the vicinity (generally up to 1,300 feet) of an area classified as Mineral Resource Zone 2, on land classified as Mineral Resource Zone 3, on land underlain by Quaternary alluvium, or on or in the vicinity of areas known to contain industrial material and gemstone resources.

4.2.3.1 Alternative A

As outlined in Section 3.2.3, Mineral Resources, both the Otay River Floodplain Site and the Pond 15 Site are classified by the City of San Diego as a Mineral Resource Zone 1, which is considered an area where no significant mineral deposits are present, or where it is judged that there is little likelihood of their presence (City of San Diego 2008). Therefore, implementation of this alternative would not result in the loss of availability of known mineral resources that would be of value to the region. Impacts would be less than significant.

Mitigation Measures

No significant impacts to mineral resources are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.3.2 Alternative B

The potential impacts to mineral resources from the implementation of Alternative B would be the same as those described for Alternative A.

Mitigation Measures

No significant impacts to mineral resources are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.3.3 Alternative C

The potential impacts to mineral resources from the implementation of Alternative C would be the same as those described for Alternative A.

Mitigation Measures

No significant impacts to mineral resources are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.4 Paleontological Resources

Significance Threshold: Impacts to paleontological resources would be considered significant if a proposed action could directly or indirectly damage a unique paleontological resource or site, or if proposed grading or excavation would disturb the substratum or parent material below the major soil horizon in a paleontologically sensitive area.

4.2.4.1 Alternative A

Under this alternative, no ground-disturbing activities are proposed. Therefore, there is no potential to directly or indirectly damage unique paleontological resources. Impacts would be less than significant.

Mitigation Measures

No significant impacts to paleontological resources are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.4.2 Alternative B

The Antiquities Act of 1906, as amended (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 431–433), was the first law enacted to protect the historic or prehistoric ruins or monuments, on any objects of antiquity, situated on lands owned or controlled by the Federal government. This act does not refer to paleontological resources specially; however, the protection of "objects of antiquity" has been interpreted to include paleontological resources. In addition to Federal requirements of the protection of paleontological resources, the Society of Vertebrate Paleontology (SVP) has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 2010). Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements included in the guidelines. Regulatory agencies often accept and use the professional standards set forth by the SVP.

The SVP (2010) has established three categories—high, low, and undetermined—to assign the paleontological sensitivity of an area or the potential for a stratigraphic or bed unit to yield significant paleontological resources. Each of these categories affects the degree to which paleontological mitigation is required.

A high potential for paleontological resources is assigned to those stratigraphic units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been previously recovered. Such units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontological resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than Recent, including areas that may contain new vertebrate deposits, traces, or trackways, are also considered to have high sensitivity.

Various geotechnical assessments have been prepared for the project sites over the years. Based on the information they provide, the eastern portion of the Otay River Floodplain Site is underlain with uncompacted fill and alluvial/bay deposits (GEOCON 1989), while the western portion is underlain with undocumented fill, estuarine deposits, unnamed marine shore sandstone, and the Bay Point Formation (Geotechnics Incorporated 2000). The Pond 15 Site is underlain by bay deposits, older bay/alluvial deposits, and the Bay Point Formation.

The City of San Diego (2007) identifies the Otay Nestor area, which includes portions of the Otay River floodplain, as having a moderate paleontological sensitivity, although the new alluvial deposits found close to the surface in this area have a low sensitivity. The Bay Point Formation is assigned a high sensitivity; however, on the project site, this formation occurs at great depth due to the presence of fill and alluvial/bay deposits over much of the project site. If the Bay Point Formation would be encountered subsurface, a potentially significant impact to paleontological resources would occur; therefore, a mitigation monitoring program would be required to ensure salvage of nonrenewable paleontological resources. To reduce potentially significant impacts to paleontological resources as a result of implementing Alternative B, MM-PALEO-1 would be implemented.

Mitigation Measures

MM-PALEO-1: Prior to commencement of any grading activity on site, Poseidon shall retain a qualified paleontologist, subject to the review and approval of the U.S. Fish and Wildlife Service (Service). The qualified paleontologist shall be on site during all rough grading and other significant ground-disturbing activities in depths greater than 10 feet below ground surface.

The paleontologist shall prepare a paleontological resources impact mitigation program for the proposed action. The program shall be consistent with the guidelines of the Society of Vertebrate Paleontologists (2010) and shall include the following:

- Attendance at the pre-construction conference by a qualified paleontologist or his/her representative.

- Development and implementation of a training program for project personnel.
- Monitoring of excavation activities by a qualified paleontological monitor in areas identified as likely to contain paleontological resources. The monitor shall be equipped to salvage fossils and/or matrix samples as they are unearthed in order to avoid construction delays. The monitor shall be empowered to temporarily halt or divert equipment in the area of the find in in the event paleontological resources are discovered.
- Because the underlying sediments may contain abundant fossil remains that can only be recovered by a screening and picking matrix, these sediments shall occasionally be spot-screened through 1/8- to 1/20-inch mesh screens to determine whether microfossils exist. If microfossils are encountered, additional sediment samples (up to 6,000 pounds) shall be collected and processed.
- Preparation of recovered specimens to a point of identification and permanent preservation. This includes the washing and picking of mass samples to recover small invertebrate and vertebrate fossils and the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost for the developer.
- Identification and curation of specimens into a museum repository with permanent retrievable storage.
- Preparation of a report of findings with an appended itemized inventory of specimens.

When submitted to the Service, the report and inventory would signify completion of the program to mitigate impacts to paleontological resources.

4.2.4.3 Alternative C

Although an additional approximately 50,000 cubic yards of material would be removed from the western portion of the Otay River Floodplain Site under Alternative C, the potential to encounter paleontological resources, as described under Alternative B, remains low. However, to minimize the potential for any significant adverse effects to paleontological resources as a result of implementing Alternative C, similar to Alternative B, MM-PALEO-1 has been incorporated into the scope of Alternative C.

Mitigation Measures

MM-PALEO-1, as outlined for Alternative B, would also be implemented for this alternative. With the implementation of the measures in MM-PALEO-1, no significant impacts are anticipated.

4.2.5 Hydrology and Water Quality

This section addresses the direct and indirect impacts to hydrology and water quality due to implementation of the proposed alternatives. Analysis in this section is based on the hydrologic modeling and subsequent analysis in the following reports.

The conclusions from each of these reports are incorporated into the discussion below.

- *Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan*, prepared by Dr. Scott A. Jenkins Consulting in September 2014 (Appendix G)
- *Otay River Estuary Restoration Project Fluvial Hydraulics Study*, prepared by Everest International Consultants in April 2016 <u>and updated in December 2017</u> (Appendix H)
- *Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year and 50-Year Floods*, prepared by Scott Jenkins et al. in October 2015 (Appendix I)

4.2.5.1 100-Year Flood and Erosion

Significance Threshold: Impacts related to the alteration of fluvial flows through the project site would be considered significant if implementation of the proposed action on the floodplain would substantially increase the projected 100-year flood elevations upstream or downstream of the project site or would substantially alter flood flow velocities and associated erosional forces.

Flood and erosion impacts were evaluated by comparing hydrodynamics under existing and proposed conditions. Water levels and velocities were assessed using a numerical model to simulate tidal and fluvial conditions in the project area.

Flood impact analyses, which were conducted for all alternatives to assess the impacts of flooding associated with the 100-year flood, focused on changes to flow patterns and water elevations during flood conditions. The erosion impact analysis evaluated project-induced velocity changes as a surrogate for erosion (scour) potential. The two-dimensional hydrodynamic model TUFLOW, described in Appendix H, was selected to assess flood impacts because this model accounts for all the necessary analysis components—tidal fluctuations, flood flows, grading changes, water control structures (e.g., open channels, culverts, pipes, weirs), levees, and salt pond configurations.

Based on the Fluvial Hydraulics Study conducted by Everest International Consultants, soils at the project site that are composed of fine sand to coarse sand would begin to erode when water velocity reaches and exceeds 0.6 ~~66~~ feet per second (ft/s). To evaluate potential erosion for this area under the 100-year flood, the areas on the Otay River Floodplain Site with maximum flood velocities higher than 0.6 ~~66~~ ft/s were identified under existing conditions and proposed conditions (Appendix G; Appendix H).

4.2.5.1.1 Alternative A

Under existing conditions, the maximum water elevations on and surrounding the project site would follow the existing overall topography. Higher water elevations would occur along the upper elevations along the Otay River and decrease toward the lower elevations in the Otay River Floodplain Site and adjacent salt ponds. Additionally, the maximum water elevations would result in flood inundation along the Otay River and Otay River floodplain below the I-5 Bridge.

Using the TUFLOW model, flood conditions were simulated for the existing condition (Alternative A). The model results indicated that during a 100-year storm event, the Otay River floodplain and salt ponds would be inundated, as would some developed areas to the north, northeast, and south of the project site. More specifically, during a 100-year storm event, flood flows from the Otay River would enter the Otay River Floodplain Site beneath the I-5 Bridge and move along the river channel toward Ponds 50 and 51. Flows from Nestor Creek would move into the site along the eastern edge of the Otay River Floodplain Site. Floodwaters from Otay River and Nestor Creek would continue to increase and inundate the Otay River Floodplain Site, and eventually overtop the southern levees in the South Bay Salt Works facility. Floodwaters would first enter the salt pond area through Pond 51 and inundate the ponds. The floodwaters would fill Ponds 50–54 first and then continue moving into Ponds 41–43, 46, and 48. Farther downstream, flood flows would also overtop the Bayshore Bikeway and the levees at Ponds 20 and 22. At the bike path bridge near 13th Street, flows would split westward to San Diego Bay or south along the west side of the Otay River Floodplain Site.

According to the model, 3 hours after the arrival of the flood on the project site, floodwaters would continue to inundate the Otay River Floodplain Site, Pond 20, Pond 22, Ponds 40–48, and eventually Ponds 23–27. By 9 hours after the arrival of the flood, floodwaters would inundate the remaining ponds (Pond 12–15, 21, 26, and 28). Floodwaters would ultimately overtop the outer levees of the salt ponds and flow into San Diego Bay. Although these areas would be affected by 100-year flood flows, no changes to the project site are proposed under Alternative A; therefore, impacts would be considered less than significant.

Additionally, under existing conditions, hydraulic conditions along the Otay River are affected by a combination of tidal exchange with San Diego Bay and watershed flows from the Otay

River. The model indicates that the Bayshore Bikeway is subject to overtopping in the vicinity of Pond 20 during the 100-year storm event, as well as during flood events with return periods of between 10 and 15 years.

Another area subject to flooding during the 100-year flood event under existing conditions is a portion of the City of Imperial Beach located in the vicinity of Bayside Park (refer to Appendix H for additional details). It is in this location that an existing drainage channel connects to the Otay River north of the Bayshore Bikeway. Under existing conditions, the 100-year flood maximum elevation in this portion of the Imperial Beach would be +9.2 feet NAVD 88, which could result in the inundation of existing structures. The implementation of Alternative A would result in no changes to flood flows on the project site, and model projections for how flood events would affect the properties in and around the Otay River floodplain under current conditions would remain unchanged. Therefore, no significant impacts related to flood elevations would occur under Alternative A.

The 100-year flood modeling was also used to establish flood velocities under existing conditions. The maximum velocity reported is that which occurs at any time over a 36-hour simulation period (see Appendix H for greater detail). In general, under existing conditions, the highest velocities would occur in the Otay River channel. These higher velocities are predicted to occur along the entire length of the Otay River from the I-5 Bridge to San Diego Bay, with velocities ranging from about 7 to 10 ft/s. Similarly, high velocities attributed to the flood flows overtopping the salt pond levees during a 100-year flood event would occur along several of the salt pond levees, including the southern outer levees of Ponds 20, 22, and 23 and the internal levee between Ponds 22 and 23. Higher velocities are also predicted to occur along the outer levees of Ponds 14 and 15 due to overtopping of the levees. High velocities are also predicted in areas east of Nestor Creek. Based on the soil characteristics for the area, the soils are likely to erode under existing conditions during a 100-year flood (Appendix H). Although flooding and erosional activities due to 100-year flood events may result under Alternative A, no changes to the project site are proposed under Alternative A; therefore, impacts would be considered less than significant.

Mitigation Measures

No changes to the project site are proposed under Alternative A; therefore, no significant impacts related to changes in flood elevations or flow velocities are anticipated and no mitigation measures are required.

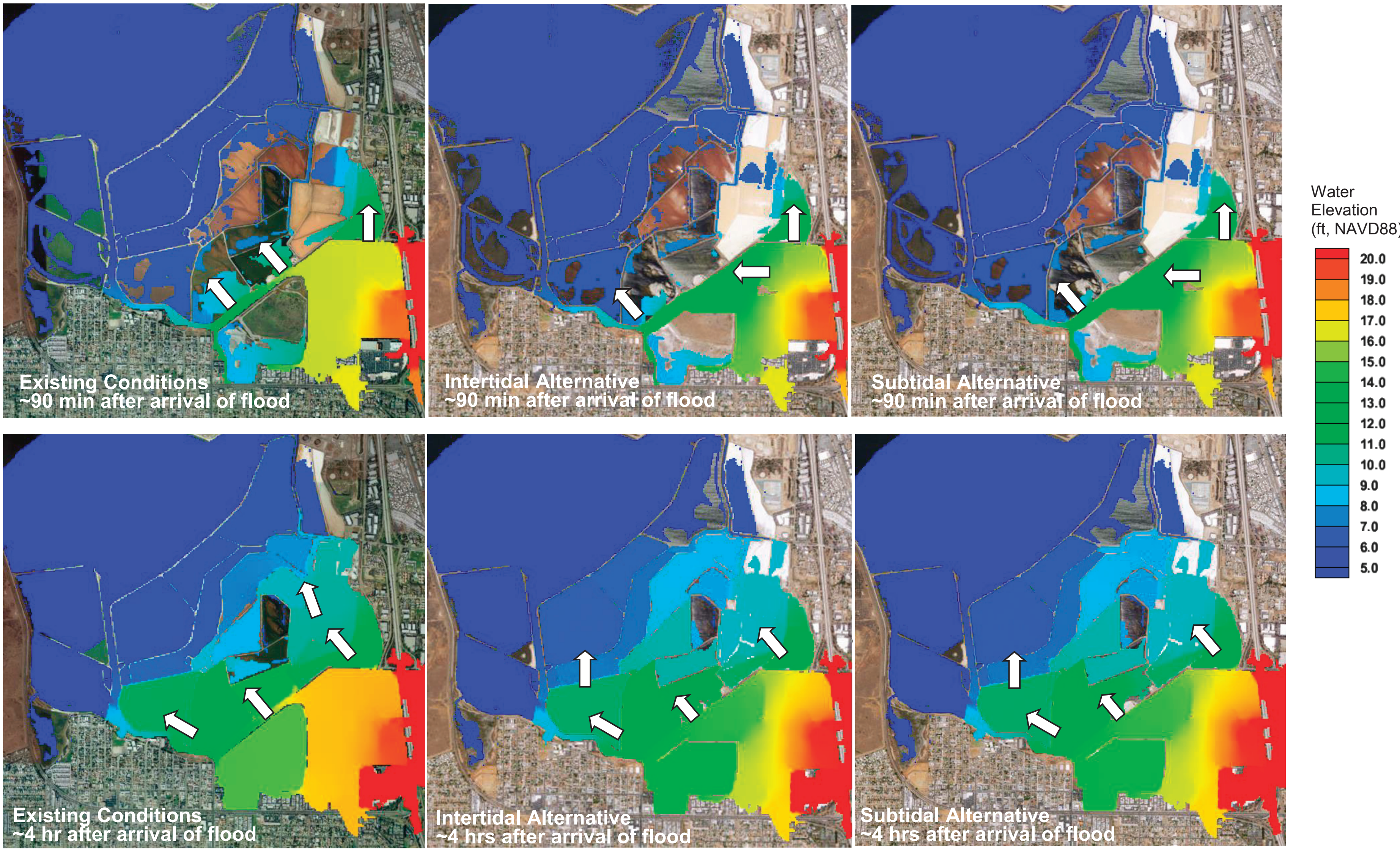
4.2.5.1.2 Alternative B

Flood Impacts: On-Site Flooding

Under Alternative B, the portion of the Otay River Floodplain Site located to the west of Nestor Creek would be lowered to support intertidal wetland and wetland-associated upland habitats by excavating approximately 320,000 cubic yards of soil from the site, of which approximately 260,000 cubic yards would be transported to and placed in the Pond 15 Site to raise the elevations to support tidal wetlands and other habitat. ~~Excavated material not needed for the project would be stockpiled in an area east of Nestor Creek for future use by the Service.~~The remaining material would be transported to a portion of the Otay River floodplain located to the east of Nestor Creek where high concentrations of DDTs have been identified. The excavated material would be spread evenly over an area of approximately 23.11 acres, creating a one to 1.5-foot thick exposure reduction cover (ERC). Another project feature that would affect flood flow through the Otay River Floodplain Site is the relocation of the existing levee along the north side of the site to the southern boundary of the Otay River Floodplain Site, as shown on Figure 2-1a.

Hydrologic modeling was conducted to assess flow patterns and water elevations for the site conditions proposed under Alternative B during a 100-year storm event. Modeling results indicate that flood elevations upstream of the I-5 Bridge would be the same as those predicted under existing conditions (Alternative A); therefore, the implementation of Alternative B would not result in significant impacts upstream of the I-5 Bridge (Appendix H).

For the area downstream of the I-5 Bridge, modeling of flow patterns and water elevations during a 100-year storm event indicate that existing flood patterns would be altered under Alternative B. Specifically, modeling results predict that the direction of flood flows during a 100-year flood event would change on the Otay River Floodplain Site. The redistribution of flood flow under Alternative B is illustrated in Figure 4.2-1, Comparison of 100-Year Floodwater Elevations. In this figure, water elevations are compared at two different times during the flood—approximately 90 minutes and 4 hours after arrival of the flood into the project area. The white arrows emphasize the general direction of flow. Under Alternative A, floodwaters would initially move through the Otay River channel, overtopping the levees at Ponds 51, 20, and 22 and flowing south along the western side of the Otay River Floodplain Site and filling it from the south. Under Alternative B, there would be no levee along the south side of the Otay River channel, allowing flood flows to move into the northern portion of the Otay River Floodplain Site, delaying the overtopping of Pond 20. ~~, while Ponds 51 and 22 would continue to be overtopped under this alternative.~~ Flood waters would still flow initially into Ponds 51 and 22, but Pond 20 would not begin to overtop until about 3 hours after arrival of floodwaters.



SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2017

FIGURE 4.2-1

Comparison of 100-year Flood Water Elevations

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The differences in the maximum 100-year flood elevation between the alternatives and existing conditions are illustrated in Figure 4.2-2, 100-Year Flood Impacts – Change in Maximum Water Elevations when Compared with Existing Conditions. The white areas indicate no change in maximum water elevation from existing conditions, while yellow areas indicate higher flood elevations under each alternative compared to the existing conditions. The highest increases in flood elevations would occur in Ponds 12–14 and 28. Lighter blue areas indicate reductions in flood elevations, which would primarily occur on the Otay River Floodplain Site due to habitat restoration and dredging of material associated with proposed action implementation. Reductions in flood elevations are also predicted to occur in the residential areas located south of the Otay River Floodplain Site in the vicinity of Palm Avenue between 18th Street and Saturn Boulevard. Flood elevations would also be reduced in the southeast portion of the Pond 15 Site. The darker blue areas in Figure 4.2-2 indicate areas that are flooded under existing conditions but would no longer be flooded under Alternative B, including much of the Pond 15 Site. In general, Alternative B would not affect flood elevations in existing tidally influenced areas of the Bay, including the recently restored western salt ponds (Ponds 10A, 10, and 11). Flood elevations would, however, increase in a number of the salt ponds, as illustrated in Figure 4.2-2.

Although flooding would increase in these areas and on the Otay River Floodplain Site (on-site flooding), this increase in flooding would not adversely affect sensitive areas such as urban development (e.g., residences, schools, and other sensitive urban uses) and would not adversely affect any other environmental resources on site. Therefore, impacts associated with on-site flooding during the 100-year storm event would be less than significant.

Flood Impacts: Bayshore Bikeway

Implementation of Alternative B would also alter the maximum 100-year flood elevation in the vicinity of the Bayshore Bikeway. As shown in Figure 4.2-3, 100-Year Flood Impacts Along Bayshore Bikeway under Alternatives B and C, the yellow area indicates higher flood elevations as compared to existing conditions along the Bikeway, while blue areas indicate lower flood elevations. In general, the 100-year flood elevations would decrease in the area that parallels Ponds 20 and 48, but would increase along that portion of the bike path that parallels Pond 22. Although changes in flood elevations along the Bayshore Bikeway would result from the implementation of Alternative B, as illustrated in Figure 4.2-3, the Bayshore Bikeway would be subject to overtopping during a 100-year storm event under all alternatives, including Alternative A (existing conditions); therefore, impacts associated with flooding along the Bayshore Bikeway would not be considered significant following implementation of Alternative B. Additionally, ~~the proposed action would include~~ if the installation of channel protection along this portion of the Bayshore Bikeway is deemed necessary to reduce erosion impacts associated with flooding, denoted as Project Feature (PF) 2 on Figure 2-1a~~.~~ ~~Implementation~~, the implementation of this project feature would ~~ensure impacts to~~ also benefit the Bayshore Bikeway. ~~would remain less than significant~~

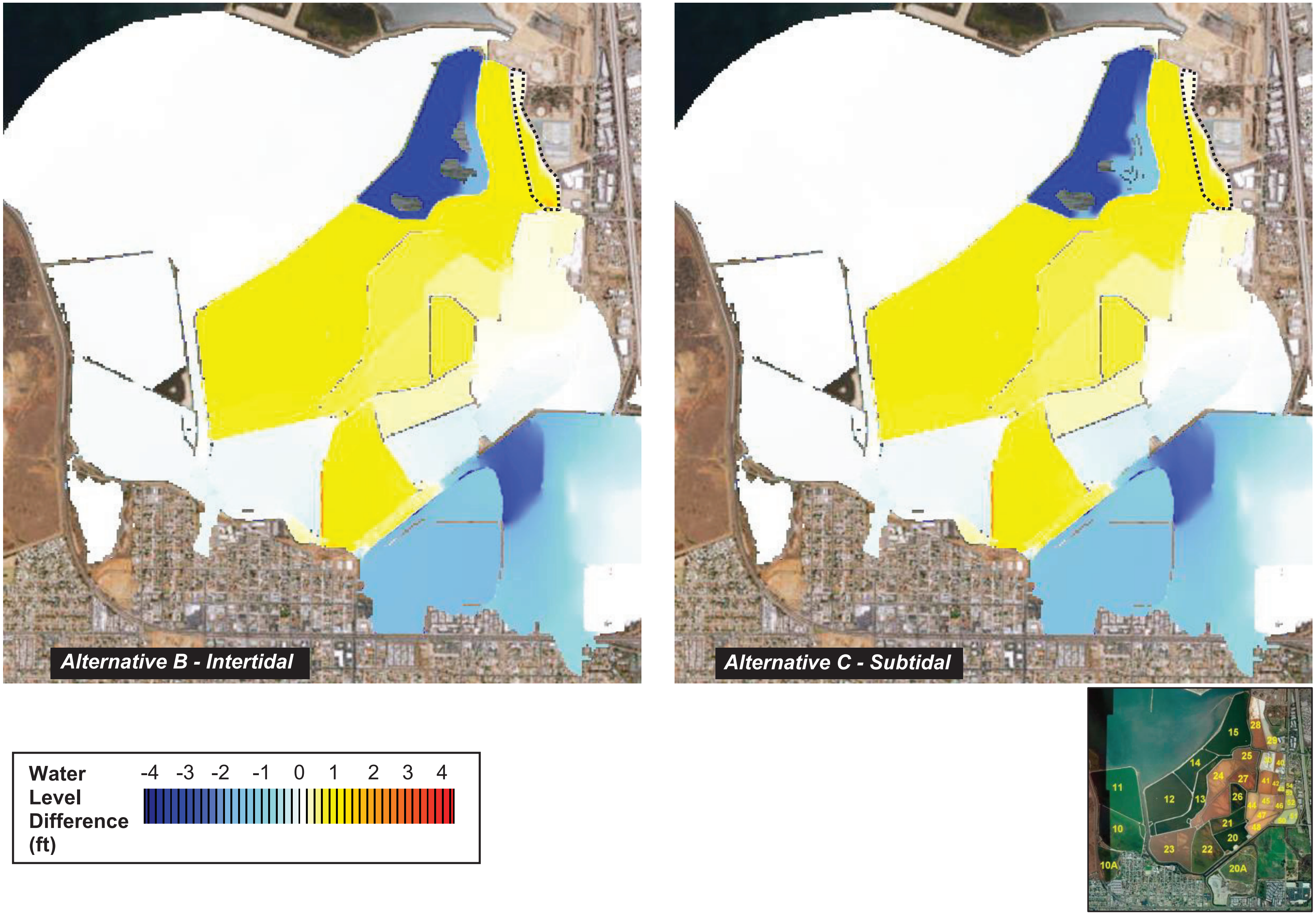
Figure 4.2-4, 15-Year and 100-Year Flood Elevations along Bayshore Bikeway, also provides flood elevations for the 15-year flood event at three points along the bike path. Water levels above the black dashed line indicate when and where overtopping is predicted to occur. No flooding is anticipated to occur for the 15-year flood event at Location 1, while at Locations 2 and 3, flood elevations are reduced under Alternative B over existing conditions resulting in a beneficial impact. In summary, Alternative B would not alleviate flooding of the Bayshore Bikeway during extreme flood events (e.g., 100-year flood), but would reduce flooding of the bike path for smaller and more frequent flood events (e.g., 15-year flood), thus resulting in a beneficial impact during smaller flood events (see Figure 4.2-4). ~~As previously described, implementation of the channel protection is included as part of the project scope under Alternative B, which would ensure that impacts to the Bayshore Bikeway following implementation of Alternative B remain less than significant during the 100-year storm event (also see discussion of erosion impacts).~~

Flood Impacts: Bayside Park—Imperial Beach

In addition to the effects of post-action flooding as described previously, the results of the hydrologic modeling indicated that flooding is expected in an area located south of the Otay River in the vicinity of Bayside Park in Imperial Beach under existing conditions and under Alternative B (see Figure 4.2-2). During a flood, floodwaters would be conveyed to the Bayside Park area via an existing storm drain constructed under the Bayshore Bikeway to the south of Pond 23, as well as overtopping the bikeway. At the location of the Bayside Park area, the model indicates that the maximum water elevation during a 100-year storm under existing conditions is 9.2 feet NAVD 88. Following implementation of Alternative B, the model indicates a maximum water elevation in the Bayside Park area would be 9.4 feet NAVD 88. Therefore, the model anticipates an increase of 0.2 feet in flood elevation under Alternative B (Appendix H).

A fluvial analysis modeling conducted for the Bayside Park area was used to evaluate various options for reducing the predicted increase in floodwater elevations in the Bayside Park area associated with implementation of Alternative B. The results of this analysis indicated that raising of the top of the levee between Ponds 22 and 23 by 2 feet, from an elevation of approximately 11 feet to 13 feet NAVD 88, would divert flood flows away from the Bayside Park area and toward the northern salt ponds. With the implementation of this action, the model indicates that the maximum water elevation during the 100-year flood would drop to 9.1 feet NAVD 88, which is 0.1 feet lower than predicted under existing conditions (Appendix H).

To avoid any increase in the maximum water elevation in the Bayside Park area during the 100-year flood, increasing the elevation of the levee between Ponds 22 and 23 by 2 feet has been included as a project feature to the proposed action, as described in Chapter 2, Alternatives, and illustrated on Figure 2-1a (Project Feature (PF) 13). Implementation of this project feature would ensure that impacts to the Bayside Park area would remain less than significant following implementation of Alternative B.



SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2017

FIGURE 4.2-2

100-Year Flood Impacts–Change in Maximum Water Elevations when Compared with Existing Conditions

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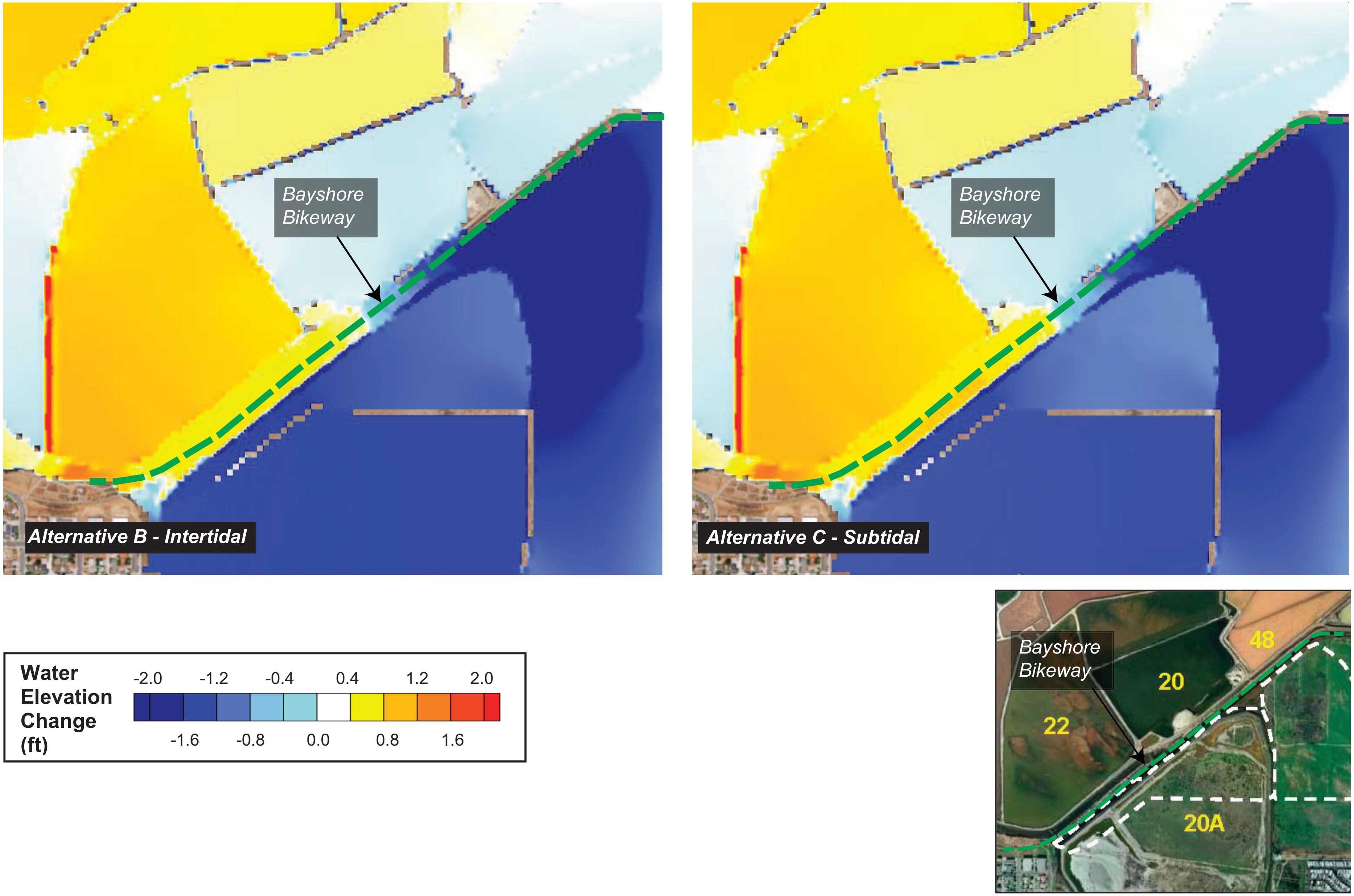

SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2017

FIGURE 4.2-3

100-Year Flood Impacts Along Bayshore Bikeway Under Alternatives B and C

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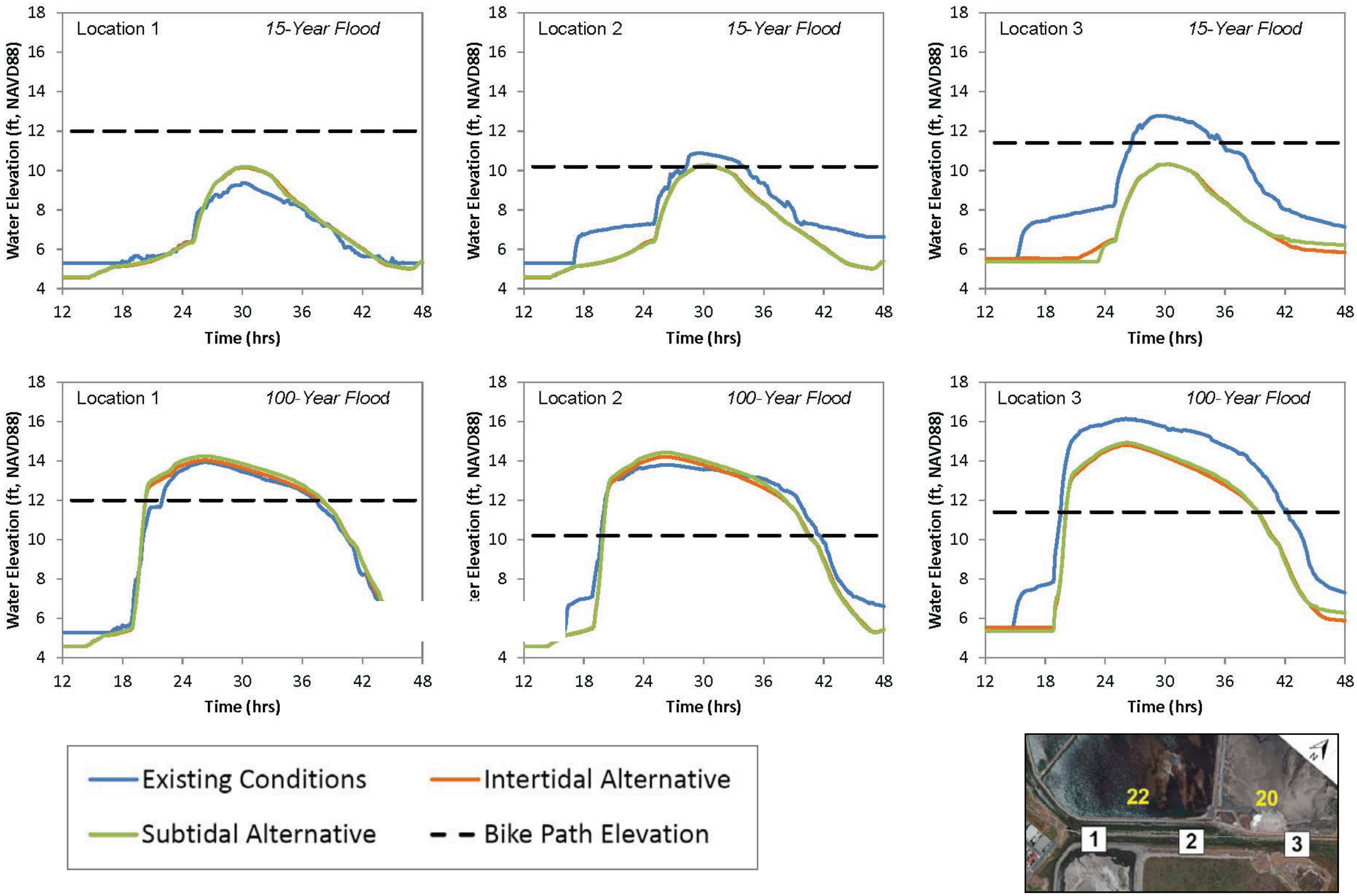

SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2017

FIGURE 4.2-4

15-Year and 100-Year Flood Elevations along Bayshore Bikeway

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Erosion Impacts

Hydrologic modeling was also used to predict potential impacts related to erosion, or scour, as a result of implementation of Alternative B. Erosion of sediment is dependent primarily on the water velocity and sediment grain size. In general, higher velocities correspond with greater erosional activity. For this analysis, erosion impacts were qualitatively assessed based on changes in velocities from the existing conditions (Alternative A) to conditions proposed under Alternative B. A comparison of maximum water velocities under Alternative A and Alternative B during a 100-year flood event is presented in Figure 4.2-5, Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative. As shown, under both Alternative A and Alternative B, the highest velocities predicted would occur along the Otay River channel and adjacent levees. Modeling results show that in the upper portion of the Otay River east of the I-5 Bridge, implementation of Alternative B would not increase the existing rate of erosion upstream of the I-5 Bridge during a 100-year flood event based on change in water velocities.

A comparison of maximum flood velocities downstream of the I-5 Bridge indicate that flood velocities under Alternative B are similar in magnitude to Alternative A, but the locations of higher and lower velocities are different under the two alternatives. The differences in flood velocities between the existing and proposed condition under Alternative B are due to the changes in elevation that would occur due to proposed grading under Alternative B. Under Alternative B, flood velocities would be higher within the Otay River floodplain than would be predicted under existing conditions, but lower velocities would occur in the ERC area under Alternative B than under existing conditions. Differences in flood velocities would also occur along the Bayshore Bikeway adjacent to Ponds 48, 20, and 22, coinciding with differences in flood elevations. Along this portion of the Bayshore Bikeway, flood flow velocities would be higher under Alternative B than under Alternative A; therefore, the potential for slope erosion along the bikeway is also higher in this area than under existing conditions. The potential for erosion along the Bayshore Bikeway would be evaluated during final engineering. If flood velocities are predicted to exceed 0.6 ft/s, PF 2 (the installation of channel protection along this portion of the bike path) would be implemented to minimize the potential for adverse effects to the bike path from erosion.

~~Erosion along the Bayshore Bikeway would be less than significant following implementation of Alternative B because PF 2 has been included as part of the proposed action scope, which would include the installation of channel protection along this portion of the bike path to reduce bank erosion and ensure flood velocities would be reduced to below 0.6 ft/s.~~

~~Other areas that would experience high velocities include the area between the proposed stock pile areas, areas around Pond 15, and Ponds 12 and 14.~~ Under Alternative A, higher velocities are predicted to occur at the outer levee of Pond 15 due to overtopping, while under Alternative B, lower velocities would occur along this levee due to the presence of the new tidal inlet at Pond 15. The inlet proposed as part of the proposed action would eliminate the potential for overtopping in Pond 15. The velocities of waters overtopping Ponds 12 and 14 are, however, predicted to be higher under Alternative B than under existing conditions. To reduce impacts associated with erosion during construction and following completion of the proposed action, including potential erosion impacts associated with the staging area and ~~stockpiles~~ERC, MM-VIS-1, MM-GEO-1, and MM-GEO-2 are provided. Implementation of these mitigation measures would reduce impacts associated with erosion to less than significant. Additionally, no changes in flow velocities are predicted for the recently restored western salt ponds under Alternative B.

Regarding the area east of Nestor Creek, modeling results indicate that Alternative B would result in an increase in flood velocities in the ~~area~~Otay River floodplain, while lower velocities would be observed east of Nestor Creek in the ERC when compared to Alternative A. To evaluate potential erosion for this area under the 100-year flood, the areas with maximum flood velocities higher than 0.6 ~~66~~ ft/s were identified under Alternative A (existing conditions) both Alternative B and Alternative C as shown on Figure 4.2-6, Existing and Proposed 100-Year Flood Maximum Velocity. Under both existing conditions and Alternative B, most of the ~~entire~~ area east of Nestor Creek is predicted to experience maximum flood velocities equal to or greater than 0.6 ft/s; therefore, under either alternative, increased erosion in this area would occur during a 100-year flood event. To reduce flood velocities at this location, revegetation east of Nestor Creek is included as part of the scope of the proposed action, as ~~shown on Figure 2-1a (see~~ described in association with the ERC (PF 14).

As part of this project feature, the area east of Nestor Creek would be ~~planted~~ revegetated with appropriate native vegetation to increase friction to slow down the flow. The appropriate frictional force required is determined by estimating the Manning's Roughness Coefficient, which represents the appropriate resistance to flood flows in channels and floodplains needed to reduce flood velocity impacts to a level that is less than significant. The hydrologic modeling conducted for the proposed action determined that a Manning's Coefficient of 0.15 is required to provide adequate frictional force to slow down flood velocities in this area (Appendix H). The Manning's formula is represented as follows:

$$\mathbf{V} = \frac{1.49}{n} \mathbf{R_h}^{2/3} \mathbf{S_e}^{1/2}$$

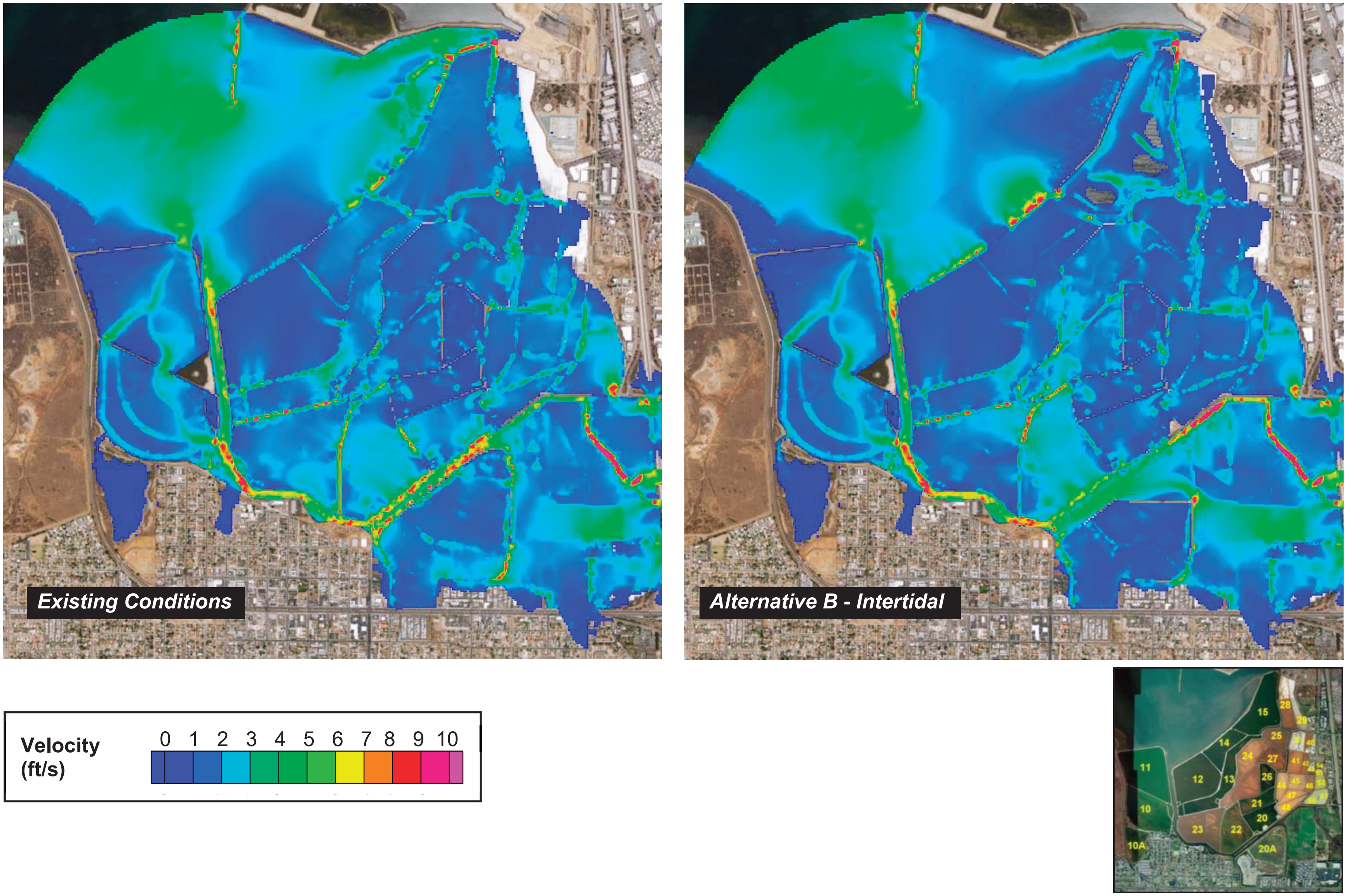
where:

V = mean velocity of flow, in meters per second

R_h = hydraulic radius, in meters

S_e = slope of energy or hydraulic grade line, in meters per meter

n = Manning's Roughness Coefficient



SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2017

FIGURE 4.2-5
Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative

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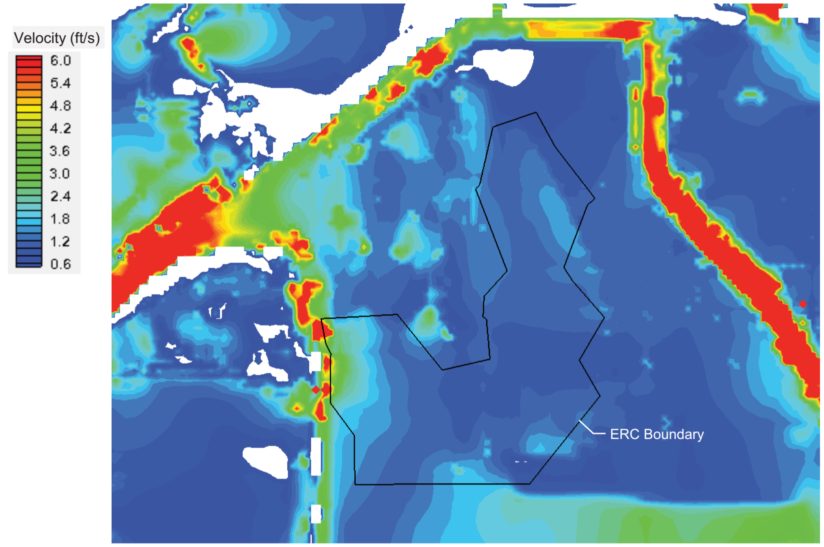
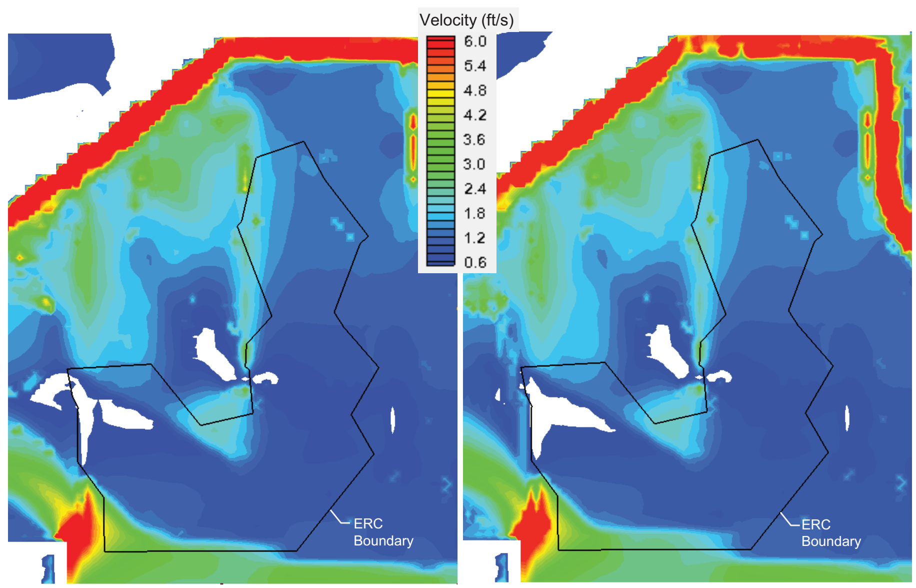


Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Existing Conditions



a) Alternative B - Intertidal

b) AlternativeC - Subtidal

Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Proposed Conditions

SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2017

FIGURE 4.2-6

Existing and Proposed 100-Year Flood Maximum Velocity

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~~As previously stated, the location of this revegetation effort is identified on Figure 2-1a as PF 14.~~ In addition to increasing friction, the roots of the vegetation would help bind the soil within the ERC, making it less erodible. Revegetation of the area east of Nestor Creek ~~(PF 14 on Figure 2-1a)~~ would increase the Manning's Roughness Coefficient to 0.15 from 0.05 ~~in this portion of the Otay River Floodplain Site~~, thus decreasing (slowing) flood velocities under Alternative B to velocities resembling those estimated under Alternative A (i.e., existing conditions). For the area adjacent to Nestor Creek, the maximum velocities under Alternative B would still be slightly higher than those under existing conditions following implementation of this project feature; however, this slight increase in velocities would not result in a potentially significant impact because the increase would be minimal and the resulting velocities would resemble those occurring under existing conditions. Therefore, following implementation of Alternative B, including the ~~project feature that would consist~~ creation of the ~~revegetation of~~ ERC and associated establishment of native plants in the area east of Nestor Creek, impacts associated with flood velocities and associated erosion at this location would be less than significant. Modeling results indicate that under either alternative with the inclusion of the ERC layer there is the potential to slightly decrease erosion east of Nestor Creek during the 100-year flood event.

For smaller flood events (i.e., flood events other than the 100-year flood event), the model indicates that under Alternative B, maximum velocities would be less than 0.6 ft/s for almost the entire Otay River Floodplain Site during the 5-year and 10-year flood event (Appendix H).

~~In summary, under Alternative B, increased erosion on the Otay River Floodplain Site is predicted during the 100-flood event, but erosion would potentially decrease over existing conditions during the more frequent, smaller flood events.~~ The overall potential impact of Alternative B on erosion across the Otay River Floodplain Site is likely to be small to negligible across the range of flood events that would be expected to occur within a 100-year period. Project features including channel protection along the Bayshore Bikeway, if warranted, increasing the height of the levee between Ponds 22 and 23, and creation and revegetation of the ERC in the area east of Nestor Creek have been included as part of the proposed action to ensure that impacts associated with flooding and erosion would be less than significant. Other impacts associated with post-action flooding and erosion in and around the site~~, including at the staging area and stockpile locations as described previously,~~ would be considered potentially significant; therefore, MM-VIS-1, MM-GEO-1, and MM-GEO-2 have been incorporated into the scope of the project under Alternative B to reduce impacts associated with flood velocities and erosion ~~at the staging area and stockpile locations~~ to less than significant.

Mitigation Measures

With the incorporation of MM-VIS-1 (as described in Section 4.2.1) and MM-GEO-1 and MM-GEO-2 (as described in Section 4.2.2) into the scope of the project, impacts associated with flood velocities and erosion ~~at the staging area and stockpile locations~~ would be reduced to less than significant.

4.2.5.1.3 Alternative C

Flood Impacts: On-Site Flooding

Similar to Alternative B, Alternative C proposes excavation in the portion of the Otay River Floodplain Site located to the west of Nestor Creek; however, Alternative C includes a combination of intertidal and subtidal habitat, which would require additional excavation on the Otay River Floodplain Site. An estimated 370,000 cubic yards of material would be excavated from the site, of which approximately 310,000 cubic yards would be transported to and placed in the Pond 15 Site to raise the elevations to support tidal wetlands and other habitat.

Modeling of flow patterns and water elevations for the site conditions proposed under Alternative C are similar to Alternative B. Flood elevations along the Otay River upstream of the I-5 Bridge are the same for Alternative C as for Alternative A. Therefore, Alternative C would not significantly impact flood conditions upstream of the I-5 Bridge.

For the area downstream of the I-5 Bridge, modeling of flow patterns and water elevations during a 100-year storm event indicate that flooding patterns under Alternative C would be very similar to those described for Alternative B, as shown on Figure 4.2-1. Comparisons between Alternative B and Alternative C show similar flood impacts in the salt ponds for both alternatives (refer to Figure 4.2-2), although the flood elevations in some ponds would be slightly higher under Alternative C. For example, the 100-year flood elevation under Alternative C would overtop the Pond 28 levee, while no overtopping of that levee would occur under Alternative B. Although overtopping of this levee would occur under Alternative C and flooding would increase in these areas and on the Otay River Floodplain Site (on-site flooding), overtopping of levees and increases in flooding would not adversely affect sensitive areas such as urban development (e.g., residences, schools, and other sensitive urban uses) and would not adversely affect any other environmental resources on site. Therefore, impacts associated with on-site flooding during the 100-year storm event would be less than significant.

Flood Impacts: Bayshore Bikeway

Flood flow velocities under Alternative C would be similar in magnitude to Alternative B, but the locations of higher and lower velocities would vary between the two alternatives. Additionally, similar to Alternative B, differences in flood velocities would be apparent throughout the Otay River Floodplain Site due to a lowering of the existing elevations to achieve desired habitat types under Alternative C. Higher velocities would occur along the Bayshore Bikeway that could result in erosion of the Bikeway’s southern embankment. PF 2, which would include installation of channel protection in this area~~, is included in the scope of the proposed action and~~ if warranted based on analysis conducted during final engineering. This protection, if deemed necessary, would ensure that impacts associated with flooding and erosion at the Bikeway would remain less than significant following implementation of Alternative C.

Flood Impacts: Bayside Park—Imperial Beach

In addition to the effects of post-action flooding as described previously, the results of the hydrologic modeling indicated that flooding is expected in an area located south of the Otay River in the vicinity of Bayside Park in Imperial Beach under existing conditions and under Alternative C. To avoid any increase in the maximum water elevation in the Bayside Park area during the 100-year flood, increasing the elevation of the levee between Ponds 22 and 23 by 2 feet has been included as a project feature to the proposed action, as described in Chapter 2 and illustrated on Figure 2-1a (PF 13). Implementation of this project feature would ensure that impacts to the Bayside Park area would remain less than significant following implementation of Alternative C.

Erosion Impacts

~~In addition to flooding-related impacts as described previously, high velocities would occur between the stockpile areas and area east of Nestor Creek. To reduce flood velocities east of Nestor Creek, revegetation of this area is included as part of the scope of the proposed action as shown on Figure 2-1a (see PF 14). Following implementation of Alternative C, including the project feature that would consist of the revegetation of the area east of Nestor Creek,~~

Implementing the ERC and associated establishment of native plants on the 23.11-acre site, as described above, would reduce flood velocities east of Nestor Creek, therefore impacts associated with flood velocities and associated erosion would be less than significant.

Other impacts associated with post-action flooding and erosion in and around the site including at the staging area~~ and stockpile locations~~, as described previously, would be considered potentially significant. To reduce impacts associated with erosion of soils at the staging area ~~and stockpiles~~, MM-VIS-1, MM-GEO-1, and MM-GEO-2 would be incorporated into the scope of the project under Alternative C. Following implementation of these measures, impacts at these locations would be less than significant.

Mitigation Measures

Implementation of MM-VIS-1 (as described in Section 4.2.1) and MM-GEO-1 and MM-GEO-2 (as described in Section 4.2.2) would reduce impacts to less than significant.

4.2.5.2 Tidal Flow

Significance Threshold: Impacts related to the alteration of tidal flows would be considered significant if projected tidal velocities following project implementation would result in measurable scour of existing tidal channels or mudflats, or could jeopardize the stability of, or increase the maintenance requirements for, adjacent levees, levee breaches, bridge pilings, or other facilities.

To assess impacts to hydrology associated with implementation of the proposed action, hydrodynamic simulations of the tidal exchange that would occur on both the Otay River Floodplain Site and the Pond 15 Site were prepared (Appendix G). It should be noted that the analysis provided in this section addresses dry weather tidal behavior only. Tidal velocities and associated impacts during wet weather are addressed in Section 4.2.5.1, 100-Year Flood and Erosion. The simulations conducted for this analysis demonstrate tidal flow velocities and the stability and potential maintenance requirements of the Otay River channel that would connect the proposed tidal basin on the Otay River Floodplain Site with San Diego Bay. This study employed hydrodynamic modeling using a research model and a littoral transport model, TIDE_FEM, to evaluate the tidal hydraulics of the action alternatives based on updated bathymetry (depth measurements) provided by Wetlands Research Associates and latest updates to San Diego Bay tides for the 1983–2001 tidal epoch. The detailed technical approach for the modeling software and assumptions are outlined in Appendix G.

4.2.5.2.1 Alternative A

Hydrodynamic simulations of the tidal exchange on the project site under existing conditions focused on peak tidal flooding and ebbing currents during spring tides. Results indicate that flooding associated with spring tidal currents are about 0.1 meters per sec (m/sec) (0.33 ft/sec) at the river mouth and then accelerate to 0.18 m/sec (0.59 ft/sec) in the deeper sections of the inlet channel (north/south reach of the Otay River adjacent to restored Ponds 10 and 11). Further up-river, currents reach 0.15 m/sec (0.50 ft/sec) in the narrower east/west reach near the railroad bridge. Flood tide currents then decelerate to less than 0.01 m/sec (0.03 ft/sec) in the upper reaches of the floodplain (Appendix G).

The tidal currents calculated in the lower Otay River and feeder channel during spring tides were compared against soils present in the area to estimate the potential for scour and erosion in these channels under existing conditions. This comparison revealed that the Otay River channel sediments have a threshold scour speed of 0.2 m/sec (0.66 ft/sec). Tidal current speeds between 0.08 m/sec (0.27 ft/sec) and 0.2 m/sec (0.66 ft/sec) would lead to bed-load transport (the movement of rocks, sediment, and particles along the channel bottom) but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.2 m/sec (0.66 ft/sec), while currents less 0.08 m/sec (0.27 ft/sec) would result in deposition (the addition of rocks, sediment, and particles to an area).

The transport thresholds of the native riverbed sediments indicate that the only potentially problematic reaches of the channel are (1) the north/south reach of channel adjacent to restored Ponds 10 and 11 and (2) two locations (referred to as “pinch points”) near the railroad bridge where a series of humps, shoals, and scour holes are found in the river bathymetry. In the north/south reach adjacent to restored Ponds 10 and 11, the channel is generally narrow and deep and has already scoured to an equilibrium depth where maximum tidal currents reach, but do not exceed, the threshold scour speed of the channel sediments. At the two identified locations near the railroad bridge, maximum tidal currents approach, but do not exceed, the sediment incipient scour speeds. Under these conditions, tidal erosion does not occur since the sedimentary bed remains in a steady state of bed-load transport. Thus, a stable, quasi-equilibrium channel is maintained under existing conditions, including a sediment transport pattern that results in neither erosion nor deposition.

One advantageous attribute of this site is that the inlet channel and the mouth of the Otay River are not subject to coastal transport by ocean waves, because the southern portion of the San Diego Bay is sheltered from high-energy shoaling swells. Consequently, the inlet channel to the Otay River Floodplain Site is not likely to infill or close from sand influx from incoming water, making the site significantly easier to maintain (Appendix G).

Under Alternative A, the hydraulic conditions on the project site would remain unchanged; therefore, no significant impacts related to tidal hydrology would occur.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.5.2.2 Alternative B

Figures 4.2-7, Alternative B – Flood Tide Progressive Flow at Mean High Water, and 4.2-8, Alternative B – Ebb Tide Progressive Flow at Mean Low Water, show the flow trajectories and depth-averaged tidal currents for Alternative B as computed by the calibrated TIDE_FEM model during spring flooding tides and spring ebbing tides, respectively. As noted in the Tidal Hydraulic Analysis conducted for the proposed action, these data were collected on September 18, 2009 (Appendix G). Velocities of tidal currents are portrayed according to the color-coded velocity scale appearing in the lower left corner of the figures.

Tidal Flows at the Otay River Mouth and into the Tidal Basin

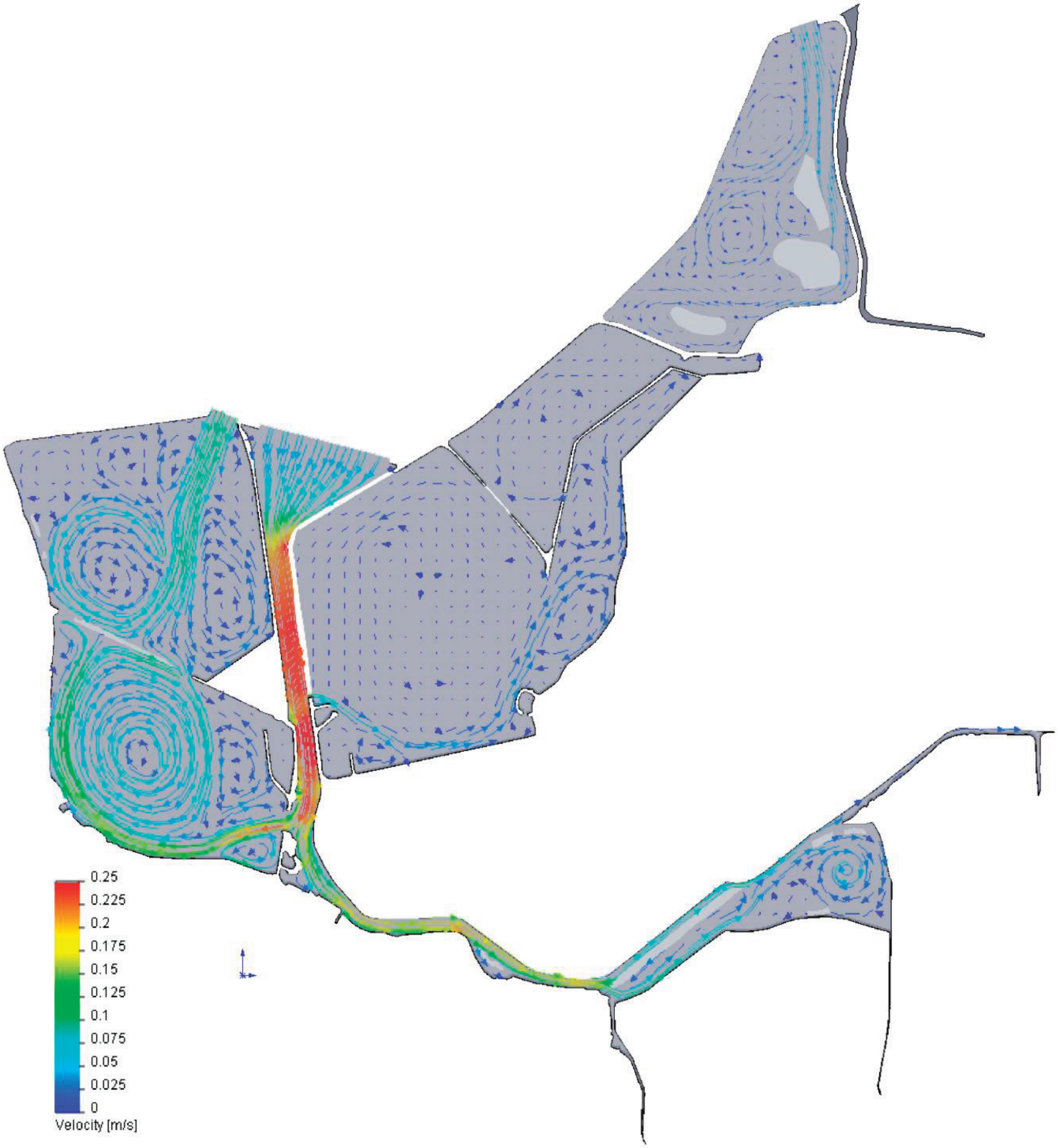
Based on the model, maximum flooding spring tidal currents under Alternative B at the mouth of the Otay River are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower north/south reach of the channel adjacent to Ponds 10 and 11 to 0.2 m/sec (0.66 ft/sec), which is slightly higher than under existing conditions. As described previously under Alternative A, tidal current speeds of 0.2 m/sec (0.66 ft/sec) would lead to bed-load transport but not erosion.

After passing Pond 10, currents would decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the two pinch points at the railroad bridge, before entering the floodplain tidal basin. The model indicated that tidal currents entering the tidal basin would initially form a well-defined jet at the west bank with speeds of about 0.08 m/sec (0.26 ft/sec). This entry jet would quickly diverge into a complex set of clockwise rotating eddies that would occupy the interior of the tidal basin, as shown in Figure 4.2-7. Eddy speeds in the tidal basin would be approximately 0.02 m/sec (0.07 ft/sec). These speeds would be insufficient to transport fine sand, but they would be an important stirring mechanism for mixing the tidal basin water mass to maintain high oxygen levels and to sustain fine silt- and clay-sized sediment particles in suspension.

Tidal current speeds at the mouth of the Otay River under Alternative B throughout an entire spring/neap tidal cycle, as predicted by modeling, are expected to reach a maximum flood flow velocity of 0.10 m/sec (+0.33 ft/sec), while the maximum ebb flow velocity at the river mouth would reach −0.09 m/sec (−0.29 ft/sec). Ebb tide flows are described in negative velocities, while positive velocities are used to describe flood tide flows. At these velocities, the Otay River mouth would be neither depositional nor erosional under Alternative B; therefore, impacts would be less than significant (Appendix G).

Tidal Flows at the Otay River Floodplain Site

Figure 4.2-7 illustrates flood tide flows under Alternative B, and Figure 4.2-8 illustrates the flow trajectories and depth averaged tidal currents for Alternative B based on model calculations during a spring ebbing tide. Based on the modeling results, the wetted area of the Otay River Floodplain Site tidal basin would be substantially reduced relative to the existing condition flood tide area, due to a grading plan that allows for almost complete drainage at mean low water tidal stages. Tidal waters would drain from the basin at very low speeds (approximately −0.01 m/sec (−0.03 ft/sec)). This feeder current would evacuate the tidal basin and then accelerate to −0.05 m/sec (−0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. Ebb flow in the channel would then accelerate further to −0.09 m/sec (−0.29 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. Impacts associated with tidal behavior at the Otay River Floodplain Site would be considered less than significant because velocities would not result in substantial erosion or sedimentation at the site.



Intertidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-7

Alternative B–Flood Tide Progressive Flow at Mean High Water

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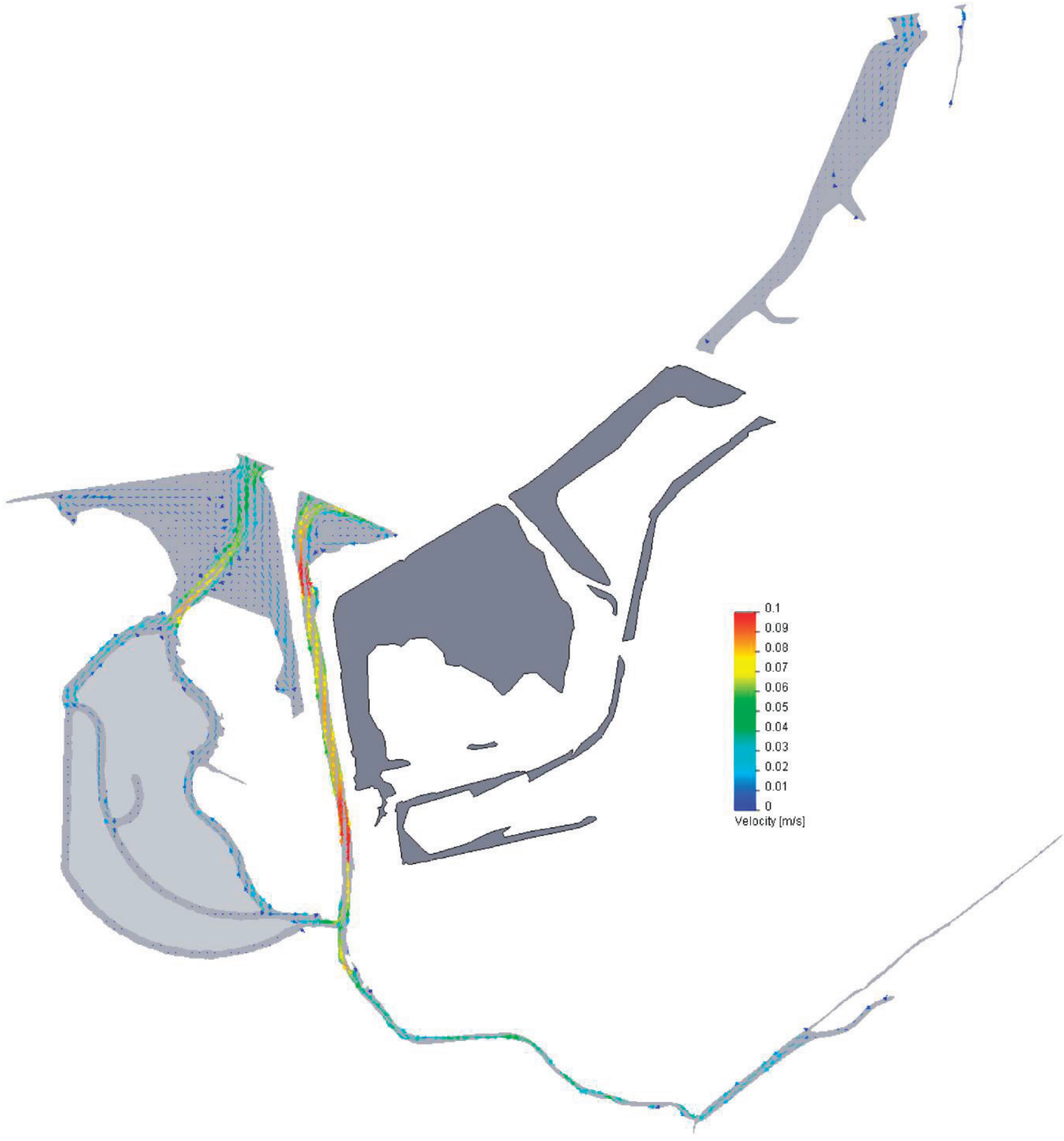

Intertidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-8

Alternative B–Ebb Tide Progressive Flow at Mean Low Water

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Tidal Flows at the Pond 15 Site

Maximum flooding spring tidal currents in the inlet channel to the Pond 15 Site would be about 0.07 m/sec (0.22 ft/sec) and then decelerate as a weak entry jet with speeds of about 0.05 m/sec (0.16 ft/sec). This entry jet would also quickly diverge into a complex set of counter rotating eddies that populate the interior of the Pond 15 tidal basin. Eddy speeds in the Pond 15 tidal basin would be approximately 0.01 m/sec (0.03 ft/sec), insufficient to transport fine sand or cohesive silts, but still providing a stirring mechanism for mixing the Pond 15 Site water mass to maintain high oxygen levels and to sustain suspension of fine silt- and clay-sized sediment particles.

In the Pond 15 Site during ebb tide flow at mean low water level, the eastern half of the basin would be completely drained and exposed, while a weak feeder current would evacuate the western half with ebb flow of about −0.02 m/sec (−0.07 ft/sec). This feeder current would accelerate to about 0.06 m/sec (0.20 ft/sec) as it flows out the inlet that would be constructed along the northeastern portion of the pond's outer levee. This velocity is below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve, located to the north of Pond 15.

Due to the size of the inlet proposed under Alternative B, velocities would be considerably less at the Pond 15 inlet opening than at the mouth of the Otay River. For Pond 15, maximum flood flow velocity at the inlet would be 0.07 m/sec (+0.22 ft/sec), while maximum ebb flow velocity would reach 0.06 m/sec (−0.20 ft/sec). These velocities would be well below the threshold scour speeds for area sediments estimated to be +/− 0.2 m/sec (+/− 0.66 ft/sec) for this area. Currents less than 0.08 m/sec (0.27 ft/sec) would result in sediment deposition; therefore, the inlet to the Pond 15 Site could result in the deposition of sediment in the inlet if there is an active sediment source nearby. However, no such source currently exists, with the exception of potential sediment yield from the tidally influenced Palomar channel during the occasional El Niño flooding event. Therefore, because tidal velocities would not result in depositional or erosional impacts associated with the proposed action under Alternative B and would not affect proposed facilities such as inlets, levees, or other facilities, changes in tidal flow and associated sedimentation impacts would be less than significant.

Regarding construction and breach of the levee at the Pond 15 inlet/outlet location, the inlet/outlet would be constructed by breaching the levee and excavating ~~the area~~ a portion of the pond at the inlet (approximately 0.44 acres) and approximately 0.79 acres to the north of Pond 15 within San Diego Bay to create an inlet/outlet channel with a bottom width of 160 feet and bottom elevation of −3.0 feet NAVD 88. Breaching of the levee at Pond 15 would be conducted after all earthwork in Pond 15 is completed, except for a fill area in Pond 15 near the proposed inlet/outlet that can be reserved to receive the cut material from the levee breach (Appendix H).

The excavation of the levee breach may create temporary water turbidity similar to the levee breach construction for the San Diego Bay Western Salt Pond Restoration Project completed in 2011. During the Western Salt Pond Restoration Project construction, an analysis of the breaching was conducted before it was implemented to determine whether such breaching would likely result in substantial erosion of material and associated transport into San Diego Bay and to assess potential impacts to turbidity. The results indicated that the impact would be minor, and there were no reported problems when the levees were breached for that project. Similar to the Western Salt Pond Restoration Project, the inlet/outlet channel and levee breach would be designed to avoid any potentially significant impacts associated with turbidity, sedimentation, and erosion impacts; however, to minimize the potential for sediment plumes entering San Diego Bay during the levee breach and inlet/outlet channel excavation, MM-HYD-1 and MM-HYD-2 are provided.

~~, MM-HYD-1 is provided. MM-HYD-1 would require that the levee breach only be excavated when turbidity levels are within 20% of ambient conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed if deemed necessary, as described in MM-HYD-1; however, installation of a silt fence is not expected to be necessary based on previous analysis conducted for a similar levee breach at the Western Salt Pond Restoration Project (Lee, pers. comm. 2016). Following implementation of MM-HYD-1, impacts associated with the levee breach proposed at the Pond 15 inlet/outlet would be less than significant.~~

MM-HYD-1 requires that prior to the breaching of Pond 15, the turbidity levels in Pond 15 and in the Bay in the area adjacent to Pond 15 would be measured to ensure that the turbidity level in Pond 15 does not exceed 20 percent of the turbidity level measured in the Bay. If turbidity levels in Pond 15 are found to exceed the 20 percent threshold, breaching would be delayed until turbidity levels in Pond 15 are consistent with the 20 percent threshold. In addition, breaching of Pond 15 would be scheduled to start during an incoming neap tide to minimize water velocities, thereby minimizing resuspension of sediment within Pond 15. During breaching, it is possible that some scour and associated resuspension could occur within the two channels located within Pond 15. If such scour is observed then silt curtains would be installed across these interior channels to minimize turbidity by reducing the amount of resuspended sediment that would exit Pond 15 and enter San Diego Bay.

Implementation of the project also includes extending the inlet channel for Pond 15 into San Diego Bay beyond the pond's outer levee. The work area associated with this portion of the inlet channel construction would be located in the open bay (i.e., not isolated by the salt pond levees) so there is the potential for excavation work in this area to impact Bay water turbidity. Consequently, MM-HYD-2 requires that a silt curtain be deployed around the work area to minimize turbidity impacts from excavation occurring in Bay waters. In addition, monitoring would be conducted to verify that turbidity levels outside of the area enclosed by the silt curtain are within acceptable levels (i.e., within 20 percent of the turbidity level measured in adjacent areas of the bay undisturbed by project activity). If acceptable levels are exceeded, excavation operations would be stopped until corrective measures are in place to reduce turbidity levels outside of the silt curtain to acceptable levels.

Following implementation of MM-HYD-1 and MM-HYD-2, impacts associated with the levee breach and channel excavation proposed at the Pond 15 inlet/outlet would be less than significant.

Summary

Based on the modeling results, during dry weather conditions under Alternative B, both the Otay River Floodplain Site and the Pond 15 Site would be in a steady-state equilibrium that is neither depositional nor erosional; therefore, no significant impacts associated with tidal flows would occur (Appendix G). Source water inlets at both the Otay River Floodplain Site and the Pond 15 Site would be stable and immune to closure or restriction by sedimentation and the inlets and adjacent wetland areas would not be subject to scour during dry weather tidal exchange under Alternative B. Impacts associated with tidal exchange, velocities, and associated scour effects at both the Otay River Floodplain Site and the Pond 15 Site would be less than significant. Additionally, following implementation of MM-HYD-1 and MM-HYD-2, impacts associated with the levee breach and channel excavation proposed at the Pond 15 inlet/outlet and the Otay channel protection actions that may be necessary at the Bayshore Bikeway bridge abutments (Project Feature 1) would be less than significant.

Mitigation Measures

To reduce impacts associated with construction of the inlet/outlet and levee breach at Pond 15, the following mitigation measure has been incorporated into the scope of the project:

MM-HYD-1 Just prior to breaching Pond 15, the U.S. Fish and Wildlife Service (Service) shall ensure that the turbidity level measured in Pond 15 does not exceed 20 percent of the turbidity level measured in the area of the Bay located adjacent to Pond 15. If the turbidity level in Pond 15 is found to exceed the 20 percent threshold, breaching shall be delayed until the turbidity level in Pond 15 is consistent with the 20 percent threshold. In addition, the breaching of Pond 15 shall be scheduled to start during an incoming neap tide to minimize water velocities, thereby minimizing resuspension of sediment within Pond 15. During breaching, it is possible that some scour and associated resuspension could occur within the two channels located within Pond 15; therefore, monitoring of turbidity levels in Pond 15 shall be conducted during the breaching process. If evidence of scour or resuspension of sediment is observed, then work shall be suspended until silt curtains are installed across the interior channels of Pond 15 to minimize turbidity and reduce the amount of resuspended sediment that could exit Pond 15 and enter San Diego Bay.

~~**MM-HYD-1** To minimize the potential for sediment plumes entering San Diego Bay during the levee breach, the U.S. Fish and Wildlife Service (Service) shall ensure that the levee is breached only when turbidity levels are within 20% of ambient conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed across the breach for the first 24 hours, if deemed necessary, to further reduce potential distribution of fine-grained material and associated turbidity. Following completion of the levee breach and final construction of the inlet/outlet at Pond 15, a qualified engineer shall inspect the site for erosion or sedimentation impacts and the structural integrity of the levee.~~

MM-HYD-2 The Service shall ensure that prior to initiating the excavation of the inlet/outlet channel in the area immediately to the north of Pond 15 in San Diego Bay (as well as within Pond 15 should the levee be breached before the portion of the channel to be located within the boundaries of Pond 15 has been excavated) that a silt curtain has been deployed around the entire inlet/outlet channel work area to minimize turbidity impacts to Bay waters as result of excavation activities. In addition, the Service shall ensure that monitoring is conducted during the excavation process to verify that turbidity levels outside of the area enclosed by the silt curtain are within acceptable levels (i.e., within 20 percent of the turbidity level measured in adjacent areas of the bay undisturbed by project activity). If acceptable levels are exceeded, excavation operations shall be stopped until the Service is assured that corrective measures are in place to reduce turbidity levels outside of the silt curtain to acceptable levels. Following completion of the levee breach and excavation of the inlet/outlet at Pond 15, a qualified engineer shall inspect the site for erosion or sedimentation impacts and the structural integrity of the levee. A report outlining the findings of the inspection, along with the identification of any concerns and recommendations for appropriate actions to address any identified concerns, shall be provided to the Service within 30 days of the inspection. Similarly, silt curtains shall be installed and turbidity levels monitored around construction activities associated with reinforcing bridge piers and when installing rock for bank protection.

Following implementation of MM-HYD-1 and MM-HYD-2, impacts would be reduced to less than significant.

4.2.5.2.3 Alternative C

Figure 4.2-9, Alternative C – Flood Tide Progressive Flow at Mean High Water, and Figure 4.2-10, Alternative C – Ebb Tide Progressive Flow at Mean Low Water, illustrate the flow trajectories and depth-averaged tidal currents for Alternative C as computed by the calibrated TIDE_FEM model during spring flooding tides and the spring ebbing tides, respectively. As noted in the Tidal Hydraulic Analysis conducted for the proposed action, these data were collected on September 18, 2009 (Appendix G).

Tidal Flows at the Otay River Mouth and into the Tidal Basin

Predicted flow velocities are essentially the same as those predicted for Alternative B. Therefore, the mouth of the Otay River would also be in a steady-state equilibrium that is neither depositional or erosional under Alternative C. Tidal current speeds at the mouth of the Otay River under Alternative C throughout an entire spring/neap tidal cycle, as predicted by modeling, are expected to reach a maximum flood flow velocity of +0.339 ft/sec, while the maximum ebb flow velocity would reach −0.289 ft/sec.

During the spring ebbing tides, flow would drain from the floodplain basin, forming a feeder current in the upper river channel with velocities of approximately −0.01 m/sec (−0.03 ft/sec). This feeder current would flow out of the tidal basin and then accelerate to −0.05 m/sec (−0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. Ebb flow in the channel would then accelerate further to −0.091 m/sec (−0.298 ft/sec) in the deeper north/south reach before discharging into San Diego Bay.

At these velocities, the Otay River mouth would be neither depositional nor erosional under Alternative C; therefore, impacts would be less than significant (Appendix G).

Tidal Flows at the Otay River Floodplain Site

Predicted flow velocities would be the same at the Otay River Floodplain Site as described previously in Alternative B. Impacts associated with tidal behavior at the Otay River Floodplain Site would be considered less than significant because velocities would not result in substantial erosion or sedimentation at the site.

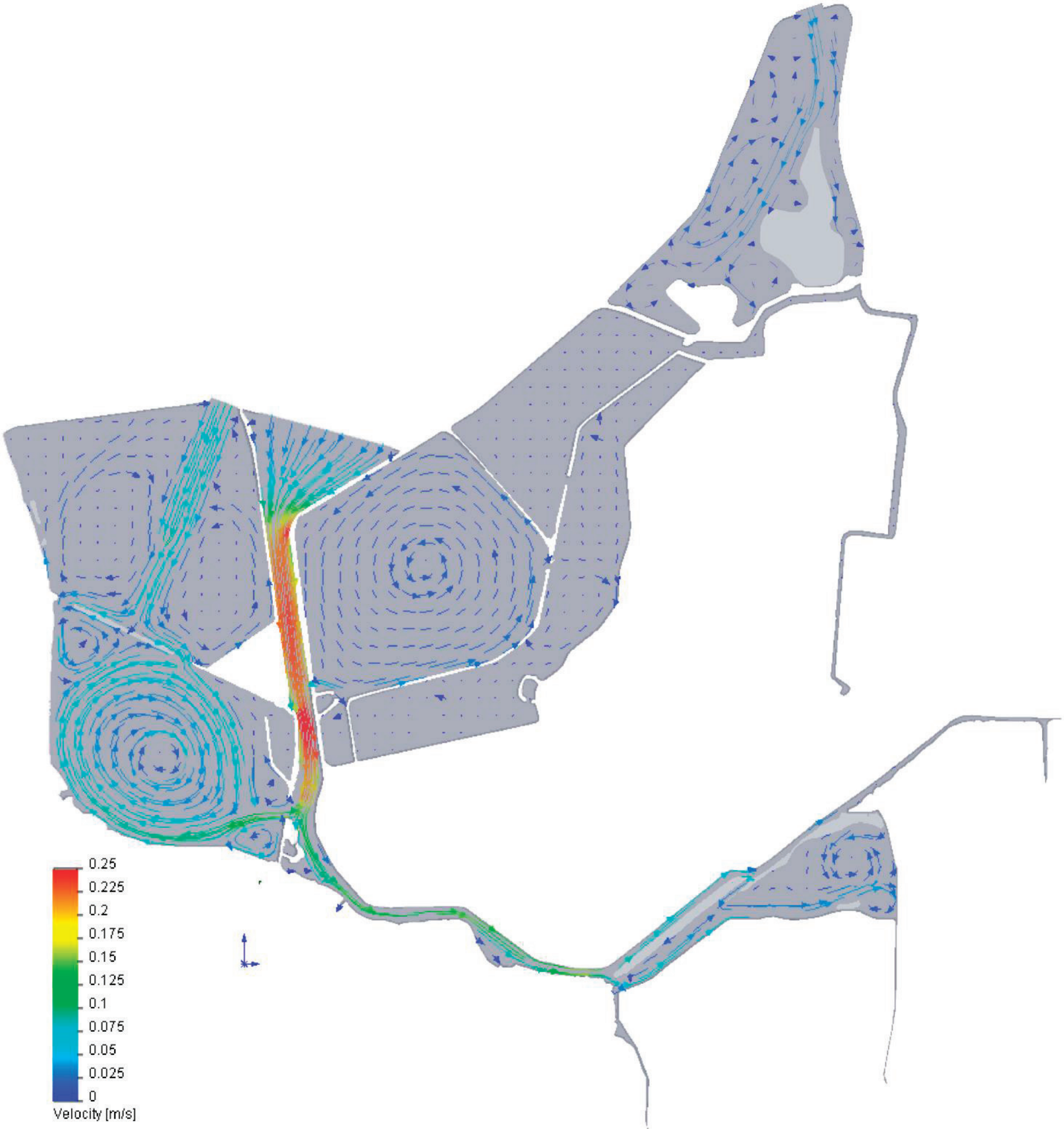
Tidal Flows at the Pond 15 Site

In Pond 15 during ebb tide flow at mean low water level, the eastern half of the basin would be completely drained and exposed, while a weak feeder current flows from the western half of the basin with ebb flow of about −0.02 m/sec (−0.07 ft/sec). This feeder current accelerates to about 0.055 m/sec (0.181 ft/sec) as it flows out the Pond 15 inlet. The inlet to the Pond 15 Site, although potentially depositional, would not be adversely affected due to the lack of an active sediment source nearby. Therefore, during dry weather conditions under Alternative C, both the Otay River Floodplain Site and the Pond 15 Site would be in a steady-state equilibrium that is neither depositional nor erosional (Appendix G). Source water inlets at both the Otay River Floodplain Site and the Pond 15 Site would be stable and immune to closure or restriction by sedimentation, and the inlets and adjacent wetland areas would not be subject to scour during dry weather tidal exchange under Alternative C. As such, erosion and sedimentation impacts at Pond 15 based on tidal velocities would be less than significant.

Additionally, the maximum flood flow velocity at the Pond 15 inlet would be +0.21 ft/sec, while maximum ebb flow velocity would reach −0.18 ft/sec, slightly less than the Pond 15 results under Alternative B and well below the threshold scour speeds for the native sediments, estimated to be +/− 0.66 ft/sec for this area.

Based on the modeling results, the ebb and flood flow velocities throughout a spring/neap cycle under Alternative C would never reach the thresholds of incipient scour and deposition of sediment is not expected to occur in the inlets.

Regarding construction and breach of the levee at the Pond 15 inlet/outlet location, the inlet/outlet would be constructed by breaching the levee and excavating the area to create a channel with a bottom width of 160 feet and bottom elevation of −3.0 feet NAVD 88. Breaching of the levee at Pond 15 would be conducted after all earthwork in Pond 15 is completed, except for a fill area in Pond 15 near the proposed inlet/outlet that can be reserved to receive the cut material from the levee breach (Appendix H).



Subtidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-9

Alternative C–Flood Tide Progressive Flow at Mean High Water

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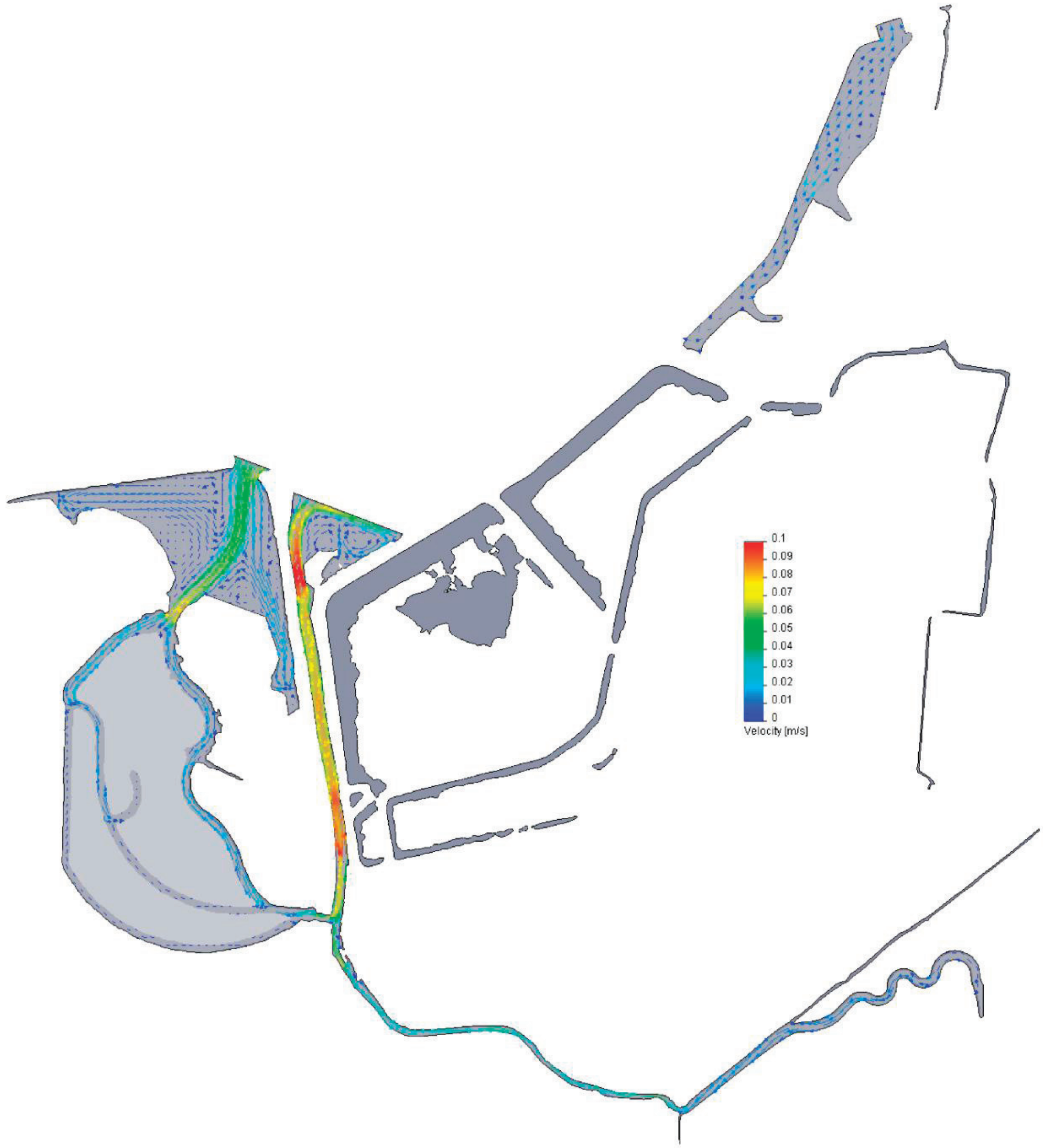

Subtidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-10

Alternative C–Ebb Tide Progressive Flow at Mean Low Water

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The excavation of the levee breach may create temporary water turbidity similar to the levee breach construction for the Western Salt Pond Restoration Project completed in 2011. During the Western Salt Pond Restoration Project construction, an analysis of the breaching was conducted before it was implemented to determine whether such breaching would likely result in substantial erosion of material and associated sediment transport into San Diego Bay and to assess potential impacts to turbidity. The results indicated that the impact would be minor, and there were no reported problems when the levees were breached for that project. Similar to the Western Salt Pond Restoration Project, the inlet/outlet channel and levee breach would be design to avoid any potentially significant impacts associated with turbidity, sedimentation, and erosion impacts; however, to minimize the potential for sediment plumes entering San Diego Bay during the levee breach, MM-HYD-1 and MM-HYD-2, as described for Alternative B above, are provided.

~~is provided. MM-HYD-1 would require that the levee breach only be excavated when turbidity levels are within 20% of ambient conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed if deemed necessary, as described in MM-HYD-1; however, installation of a silt fence is not expected to be necessary based on previous analysis conducted for a similar levee breach at the Western Salt Pond Restoration Project (Lee, pers. comm. 2016). Following implementation of MM-HYD-1, impacts associated with the levee breach proposed at the Pond 15 inlet/outlet would be less than significant.~~

Following implementation of MM-HYD-1 and MM-HYD-2, impacts associated with the levee breach and channel excavation proposed at the Pond 15 inlet/outlet would be less than significant.

Mitigation Measures

MM-HYD-1 and MM-HYD-2, as provided for Alternative B, would be implemented. Following implementation of MM-HYD-1, impacts would be reduced to less than significant.

4.2.5.3 Water Quality

Significance Threshold: Impacts would be considered significant if implementation of the proposed action would result in violations of water quality standards or waste discharge requirements, a substantial increase of downstream sedimentation, or the introduction of contaminants (non-point source pollution) into the watershed. Substantial changes in groundwater or surface water quality as a result of the proposed action would also be considered significant.

Water quality is affected by sedimentation caused by erosion, runoff carrying contaminants, and direct discharge of pollutants (point-source pollution). As land is developed, new impervious surfaces send an increased volume of runoff containing oils, heavy metals, pesticides, fertilizers, and other contaminants (non-point source pollution) into adjacent watersheds. Stormwater that accumulates on impervious surfaces, such as parking lots, roof tops, and streets, drains directly and indirectly to waters of the United States. The proposed action would not include large areas of impervious surface because the proposed action would primarily consist of habitat restoration efforts; therefore, this section focuses on the impacts associated with existing environmental conditions that may affect water quality at the project site, and impacts associated with implementation of the proposed action, particularly during construction, that may contribute to water quality degradation.

Under Section 303(d) of the Clean Water Act, the State Water Resources Control Board was required to develop a list of water quality limited segments for jurisdictional waters of the United States. The waters on the list do not meet water quality standards; therefore, the Regional Water Quality Control Boards were required to establish priority rankings, called total maximum daily loads, and develop action plans to improve water quality. The San Diego Bay is listed under Section 303(d) of the Clean Water Act for PCBs. The Otay River at the project site is not listed as an impaired water body for any pollutants under Section 303(d) of the Clean Water Act (SWRCB 2015).

A fluvial sedimentation analysis was conducted to identify potential impacts associated with fluvial sediment delivery and sedimentation associated with the proposed action. Analytical methods and existing data were used to estimate fluvial sediment loads from the watershed, which were then used to estimate potential sedimentation of the proposed wetland (Appendix H). Impacts associated with DDT contamination as it relates to flooding, erosion, and sedimentation activity is analyzed in Section 4.2.10, Contaminants.

4.2.5.3.1 Alternative A

The Otay River Floodplain Site, and to a smaller extent, the Pond 15 Site, would be subject to erosion during large storm events under existing conditions that could lead to the transport of existing contaminants in the surrounding area into these sites. As described in Sections 4.2.5.1 and 4.2.5.2, soil composed of fine to coarse sand, as identified on the project site, would start to erode when the water velocity reaches and exceeds 0.6 ft/sec. As described in detail in Appendix H, hydrologic modeling of existing conditions indicates that velocities in excess of 0.6 ft/sec would occur in this area under various storm events, with the greatest erosion occurring during the 100-year flood event. Therefore, under existing conditions, erosion could occur on the project site during a flood event resulting in the deposition of sediments, along with any contaminants present in those soils, into the Otay River channel and ultimately San Diego Bay (refer to Section 4.2.10 for additional information regarding contaminant-related impacts, including DDT). Although transport of contaminated soils into surrounding water bodies could occur under Alternative A during a large storm event, no grading, vegetation removal, or other activities that could affect flood flow velocities or alter the direction of water movement across the site would occur. Therefore, Alternative A would not result in any actions that would exacerbate the effects of existing conditions, and no significant impacts to water quality would occur through implementation of Alternative A.

In addition, there would be no net deficit in aquifer volume or a reduction in the local groundwater table as a result of Alternative A (Appendix H).

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.5.3.2 Alternative B

Construction-Related Water Quality Impacts

Implementation of the proposed action could entail routine transport of potentially hazardous materials, including gasoline, oil solvents, cleaners, and other common substances associated with construction equipment, support vehicles, and construction materials. Unanticipated and/or unintended release of these substances could result in potentially significant surface water quality and groundwater quality impacts; therefore, MM-HYD-~~2~~3 is provided. MM-HYD-~~2~~3 would require preparation and implementation of a hazardous substance management, handling, storage, disposal, and emergency response plan. Implementation of MM-HYD-~~2~~3 and the associated hazards response plan would reduce impacts related to unanticipated release of substances to less than significant.

Additionally, during transport of excavated soil between the Otay River Floodplain Site and the Pond 15 Site, unintended release or spill of soil would have the potential to occur under ~~all three~~ both transport options (truck transport or~~,~~ transport via conveyor belt~~, or transport via slurry pipeline~~). MM-HYD-~~3~~ 4 is provided to mitigate impacts related to unanticipated soil spillage during truck transport or transport via conveyor belt. ~~. MM-HYD-4 is provided to mitigate impacts related to unanticipated soil spillage during transport via either conveyor belt or slurry pipeline.~~ Implementation of~~ MM-HYD-3 or~~ MM-HYD-4, as appropriate, would reduce impacts associated with material transport to less than significant.

Moreover, as provided in MM-GEO-1, a SWPPP would be prepared that specifies BMPs to be implemented during project construction to prevent pollutants from contacting stormwater and to control erosion and sedimentation, which may result in the introduction of contaminants to nearby water bodies, including the Otay River Floodplain Site, the Pond 15 Site, San Diego Bay, and the Otay River. The SWPPP would be prepared and submitted to the Regional Water Quality Control Board for review and approval before construction begins. Implementation of the

SWPPP during construction would reduce potential impacts associated with the introduction of construction-generated contaminants to nearby water bodies to less than significant.

Sediment Transport and Loading

A fluvial sedimentation analysis was conducted by Everest International Consultants as part of the *Otay River Estuary Restoration Project Fluvial Hydraulics Study* (Appendix H) to evaluate fluvial sediment delivery from the upstream watershed to the Otay River Floodplain Site and the subsequent rate of sedimentation under the proposed action.

As described in the fluvial hydraulics study, in the Otay River Watershed, fluvial sediments are transported from the watershed along the Otay River into San Diego Bay. Soils along mountains and canyons are primarily eroded during storm events and washed downstream. A portion of eroded sediment, typically gravels and sands, deposits along the riverbed, while finer sediment generally deposits in the river floodplain or delta that forms where the river meets San Diego Bay. Overall, sediment loadings are relatively small because sediment from the upper portion of the watershed is not transported past the Lower Otay Reservoir (Appendix H).

Additionally, not all of the sediment loadings from the Otay River Watershed would reach the proposed Otay River Floodplain Site because only portions of the discharge from the Otay River would go through the site. Moreover, depending on the sediment distribution in the sediment loads, some of the larger sediments would deposit along the riverbed and only the fine sediments in suspension would be transported with the flow into the Otay River Floodplain Site.

The total sediment loading generated from the watershed is composed of eroded sediment of different sizes. Sediment from the Otay River Watershed is generated from areas with roughly half sedimentary and half Southern California batholith, resulting in a general sediment composition of approximately 50% fines and 50% sands. A portion of the sediment load, primarily sands or gravels, would be deposited mostly in the riverbed. Finer sediment material is more likely to stay in suspension and be transported with the river flow. Therefore, it is estimated that only approximately 50% of the estimated total sediment loadings from the watershed would stay in suspension, which is approximately 323 to 680 cubic yards per year.

As described previously, only a portion of river flow and its associated suspended sediment would flow through the proposed Otay River Floodplain Site, and as a result, the suspended sediment load from the watershed to the site area would be less than the above-estimated 323 to 680 cubic yards per year. During flood events, a portion of the flow would overtop the levees along the river and would not flow through the Otay River Floodplain Site. Based on TUFLOW model results, only about 15%, 45%, and 60% of the flood flow for the 25-, 50-, and 100-year flood events, respectively, would pass through the proposed Otay River Floodplain Site. Because sediment loads in general are associated with flood events, based on the model results for the 25-

50-, and 100-year events, it is estimated that only approximately 50% of the estimated suspended sediment loads of 323 to 680 cubic yards per year would go through the project area (i.e., the annual sediment load to the Otay River Floodplain Site would be approximately 160 to 340 cubic yards per year (Appendix H).

Based on the technical findings described in Appendix H and as informed by the modeling results, it is unlikely that all the suspended sediments passing through the Otay River Floodplain Site would settle to the bed; however, a conservative estimate of the sedimentation rate in the Otay River Floodplain Site is to assume all the suspended sediment would be uniformly deposited over the entire site area (33.51 acres). Under this conservative assumption and the estimated annual suspended sediment load of 160 to 340 cubic yards per year, the estimated sedimentation rate in the proposed Otay River Floodplain Site would be between 0.04 and 0.08 inches per year. If it is assumed that approximately half of the suspended sediment that passes through the site would actually settle and stay in the wetland, the average annual sedimentation rate in the wetland would be approximately 0.02 to 0.04 inches per year, which is considered low (Appendix H). Therefore, because these conservative sedimentation rates would be considered low, sedimentation transport resulting from flood events would not result in significant water quality impacts, and impacts would be less than significant.

Introduction of Contaminants into Nearby Water Bodies

Implementation of the proposed action would involve creating various wetland and upland habitat types, and as a result, no permanent physical development would occur other than minor supporting project features as shown on Figure 2-1a. Because no permanent physical development is proposed, no substantial increase in impervious surfaces would be introduced into the project area that could increase non-point source pollutant runoff and associated introduction of contaminants to nearby water bodies. Additionally, following completion of construction activities, no other feature of the proposed action would introduce additional (non-existing) contaminants to the area that could run off or be released into the Otay River Floodplain Site, the Pond 15 Site, the Otay River, the San Diego Bay, or any other nearby water body.

Moreover, large storm events, such as the 100-year flood event, would potentially result in the transport of existing contaminant sources, or salinity-laden water sources from adjacent salt ponds, to the Otay River Floodplain Site and, to a smaller extent, the Pond 15 Site. Although the potential for this occurrence exists, implementation of the proposed action would not exacerbate existing contaminant impacts to nearby water bodies, including those proposed under the proposed action. The Otay River Floodplain Site and Pond 15 Site would be designed, using berm buffers and other protective project features, to protect and isolate the proposed wetland habitats from the introduction of contaminants into the site boundaries. Furthermore, the proposed Otay River Floodplain Site and Pond 15 Site would not be more subject to flooding and associated transportation of contaminants than surrounding water bodies in the area, including the Otay River and the San Diego Bay. These large storm events would occur whether the proposed action is implemented or not; therefore, implementation of the proposed action would not result in a significant impact related to the transport of existing contaminants to the Otay River Floodplain Site or the Pond 15 Site or any other nearby water body.

Other impacts associated with post-action flooding and erosion in and around the site, including at the staging area and ~~stockpile locations~~ERC site, as described previously, would be considered potentially significant. To reduce impacts associated with erosion, sedimentation, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 are provided. Following implementation of these measures, impacts associated with erosion, sedimentation, and material transport (and thus, the introduction of contaminants to water bodies) would be less than significant.

Refer to Section 4.2.10 for detailed information regarding contaminant-related impacts, including DDT, under the proposed action.

Herbicide Use for Control of Invasive Species

The control of invasive plant species within the project site will be implemented in accordance with the Service's Integrated Pest Management (IPM) Policy, which addresses pest management activities on and off Service lands. The IPM policy (Part 569, FW1 of the Service Manual) establishes procedures and responsibilities for pest management activities, adopts IPM as the Service's method for making pest management decisions; and provides guidance on how to implement IPM for all pest management activities. Control of invasive plants within the project site will employ an IPM approach. This approach will include physical removal of invasive plants, as well as the potential use of herbicides.

Before an herbicide can be used on a Refuge, it must be approved through the Service's Pesticide Use Proposal System (PUPS), which has been established to ensure that all chemical pesticides approved for use have been reviewed for their potential impacts to groundwater, surface water, and terrestrial and aquatic non-target vegetation and wildlife, including threatened and endangered species. The PUPS identifies specific pesticides approved for use on each Refuge, as well as provides details on target pests, current site conditions, presence of sensitive habitats or species, application dates, rates, and methods, and best management practices (BMPs) to be employed to avoid impacts to Refuge resources and the surrounding environment. Pesticides approved for use are those that pose the lowest toxicity-related threat to non-target terrestrial and aquatic ecosystems while addressing the specific pest control objectives. The pesticides that could be approved for use in association with this project include products with the active ingredient glyphosate (e.g., Aquaneat, Razor Pro), imazapyr (e.g., Stalker, Habitat), or triclopyr (e.g., Garlon 3A, Garlon).

The use of herbicides to control invasive plants could pose several environmental risks, including water contamination and persistence in the environment (Bossard et al. 2000). The potential for such risks is considered minimal due to the types and limited quantities of herbicides proposed for use within the project site, the requirement that all applications of approved pesticide products be conducted in accordance with the specifications on the product label, and the need to have all potential products reviewed and approved through the PUPS. The basic hazards and environmental fate of the products currently considered for use on the project site are presented in Table XXX.

Table XX
Environmental Fate of Herbicides Proposed For Use within the Project Site
(Factors Specific to Air and Water Quality)

Active Ingredient	Application Details	Solubility in Water	Basic Hazard Identification
Glyphosate (containing surfactant)	Do not apply directly to water, do not apply when winds exceed 10 miles per hour or when inversion conditions exist	Very High	Non-volatile; runoff, leaching potential (half-life in water 12 days to 10 weeks); immobile in soil (half-life in soil, 1 to 174 days)
Glyphosate (mixed with water or nonionic surfactant)	Application should not occur during a temperature inversion, as drift potential is high	Very High	Non-volatile; runoff, leaching potential (half-life in water 12 days to 10 weeks); immobile in soil (half-life in soil ranges from 1 to 174 days)
Triclopyr (ester)	Highly volatile, apply at cool temperatures and no wind	Medium	Insoluble and persistent in water; very high mobility in soil (average half-life in soil, 30-90 days; in anaerobic soils, half-life is considerably longer (1,600-1,300 days)
Imazapyr (mixed with water and a surfactant)	Due to its persistence in the environment, it is preferable to apply directly to vegetation (using a low-volume backpack, cut-stump, or basal bark application) rather than a broadcast spray method	High	Does not volatize readily, but increases with temperature, soil moisture, and decreasing clay content; average half-life in soil 1 – 5 months; average half-life in water 2 days

Potential impacts to water quality from the use of herbicides can occur because of product drift during application. Several factors influence drift, including spray droplet size, wind and air stability, humidity and temperature, physical properties of herbicides and their formulations, and the method of application. Accidental drift is most likely to happen when the chemical is applied by broadcast method, particularly via a boom. Drift is less likely to occur when other methods are used such as backpack sprayer or wick application.

There is also the potential for surface water contamination when herbicides are applied intentionally or accidentally near wetland areas or when soil-applied herbicides are carried away in runoff to surface waters. To minimize such impacts, decisions as to which herbicide should be used in a particular area are determined based on site and weather conditions, soil type, depth of water table, presence of water sources, and guidance provided via the PUPS approval process. Application schedules are designed to avoid impacts to water quality while remaining consistent with the objective of the vegetation treatment program.

To ensure that adverse effects to water quality related to the application of pesticides will not occur, Refuge staff and/or qualified individuals working under the direction of Refuge staff will adhere to all label directions (e.g., application methods and rates; proper cleaning, storage, and disposal of application equipment and herbicide products), Service regulations, and guidance provided through the PUPS approval process.

Products with the active ingredient glyphosate and triclopyr can be persistent in the environment and can impact water quality if improperly applied. To avoid such impacts, these products are applied in accordance with product label requirements and in a manner that avoids spray drift and takes into consideration environmental factors such as wind, temperature, humidity, potential for rainfall, and temperature inversions. The lowest application rate needed to achieve the desired control is selected to minimize the amount of product used on a particular treatment site. Buffers are also provided between treatment areas and water courses as required by the product label.

The following BMPs, which are intended to protect water quality when applying herbicides, would be implemented, as applicable, throughout the life of the project:

- Pesticide treatments will only be conducted under the supervision of Service personnel and all non-Service applicators must have the appropriate State certification to safely and effectively conduct these activities on Refuge lands and waters.
- Applicators will comply with all Federal, State, and local pesticide use laws and regulations, as well as Departmental, Service, and NWRS pesticide-related policies, including using the appropriate application equipment and application rates as specified on the pesticide label.
- Buffers will be maintained between sensitive resource areas and treatment areas; the width of the buffer will vary depending upon the type of wetland resources present and the product being applied. (The product-specific Chemical Profile and/or PUP will address buffer requirements.)

- Low impact herbicide application techniques (e.g., spot treatment, cut stump, oil basal, Thinvert system applications) rather than broadcast foliar applications (e.g., boom sprayer, other larger tank wand applications), will be used whenever practical.
- When the low impact methods described above are not feasible or practical, low volume rather than high volume foliar applications will be made to maximize herbicide effectiveness and ensure correct and uniform application rates.
- Applicators will use and adjust spray equipment to apply the coarsest droplet size spectrum with optimal coverage of the target species while reducing drift.
- When spray applications are deemed necessary due to species type and/or extent of the infestation, such applications will occur during low (average less than 7 mph and preferably 3-5 mph) and consistent direction wind conditions with moderate temperatures (typically less than 85°F). In addition, spray applications will not be conducted on days with >30% forecast for rain within six hours, except for pesticides that are rapidly rain fast (e.g., glyphosate in 1 hour), to minimize or eliminate potential runoff.
- Applicators will avoid spraying during inversion conditions (often associated with very low to calm wind conditions) that can cause herbicide drift to non-target areas.
- Equipment will be calibrated regularly to ensure that the proper rate of pesticide is applied to the target area or species.
- Spray applications will be made at the lowest height for uniform coverage of target pests to minimize or eliminate potential drift.
- A one-foot no-spray buffer from the water's edge will be used, where applicable, and when it does not detrimentally influence effective control of pest species.
- Applicators will use a non-toxic dye to aid in identifying treated target areas and any areas of over spray or drift. A dye can also aid in detecting equipment leaks.
- Refuge staff will consider the timing of a pesticide application to ensure that native plants are protected (e.g., senescence) while effectively treating invasive plants.
- Equipment will be calibrated regularly to ensure that the proper rate of pesticide is applied to the target area or species.
- All pesticide spills will be addressed immediately using procedures identified in the Refuge's spill response plan.

Based on the scientific analyses documented in the "Chemical Profiles" prepared by the Service for pesticides used on National Wildlife Refuges, the pesticides proposed for use to control invasive plant species within the project site would not result in any significant adverse effects to water quality or other aspects of the environment due to the relatively low risk to surface and groundwater quality as a result of low toxicity or short persistence in the environment, and/or compliance with general and pesticide-specific BMPs. No mitigation is therefore required.

Summary

In summary, Alternative B would not violate any water quality standards or waste discharge requirements, substantially increase or contribute to downstream sedimentation, or otherwise substantially degrade existing water quality. Although contaminants from soils in the eastern portion of the Otay River Floodplain Site may erode into and be suspended in floodwaters during a large storm event, implementation of Alternative B would not exacerbate this existing condition, nor would it introduce any additional contaminants to the site or nearby water bodies. Therefore, impacts would be less than significant. To reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 are provided. Following implementation of these measures, impacts associated with erosion, sedimentation, and material transport (and thus, the introduction of contaminants into water bodies) would be less than significant.

Refer to Section 4.2.10 for detailed information regarding contaminant-related impacts, including DDT, under the proposed action.

Mitigation Measures

To reduce potential impacts identified associated with material transfer between the Otay River Floodplain Site and the Pond 15 Site, the following mitigation measures are provided:

MM-HYD-~~2~~3 Prior to commencement of construction activities, the contractor shall prepare to the satisfaction of the Service a hazardous substance management, handling, storage, disposal, and emergency response plan for all phases of construction. The plan shall address where and how construction vehicles will be parked, fueled, and serviced and what actions will be taken to avoid and reduce the risk of accidental release of hazardous materials (e.g., diesel fuel, gasoline, lubricants, coolant, oil solvents, cleaners) during construction activities at the site.

The plan shall also identify the worst case spill scenario and list the protocols for spill prevention and response actions that would be taken in the event of unintended spillage of hazardous materials or unintended release of hazardous substances during construction activities.

As part of plan implementation, a hazardous materials spill kit adequate to respond to the identified worst case spill scenario shall be maintained on site and a construction monitor shall be designated to ensure that all contractors are in compliance with applicable regulations, including regulations regarding hazardous materials and hazardous wastes, including disposal. Hazardous materials shall not be disposed of or released on the ground, in the underlying groundwater, or in any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including litter, garbage, and other solid waste, shall be diverted, recycled, or properly disposed of. Petroleum products and other potentially hazardous materials shall be removed to a waste facility permitted to treat, store, or dispose of such materials.

MM-HYD-~~3~~4 The Service shall ensure that appropriate measures are implemented by the contractor during the transport of excavated material from the Otay River Floodplain Site to the Pond 15 Site to prevent the release of excavated material and dust into adjacent upland and wetland habitats and open water areas ~~and~~, as well as to minimize the potential for tracking of dirt onto surface streets. Such measures shall include always covering the loads of trucks hauling ~~sediment~~excavated or other loose materials ~~or~~on public streets and requiring ~~them~~trucks hauling materials within the project site to maintain at least 2 feet of freeboard (i.e., vertical space between the top of the load and top of the trailer); watering active haul roads and staging areas as needed to minimize the generation of dust from construction activity; installing wheel washers where vehicles enter and exit unpaved roads; conducting daily street sweeping if visible soil materials are carried to adjacent streets; and establishing construction traffic speeds of 15 miles per hour or less on all unpaved roads. All construction workers shall be educated on proper protocols for loading, transport, and unloading of trucks prior to commencement of soil-hauling activities.

If excavated material is to be transported between the Otay River Floodplain Site and the Pond 15 Site via conveyor belt, the following procedures shall be followed:

a. While excavated material is being loaded onto the conveyor belt for transport to Pond 15, the Contractor shall ensure that dust suppression is performed in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive.

b. During or after the excavated material is loaded onto the conveyor belt, the excavated material shall be sprayed with water to prevent material from blowing off the conveyor belt and if necessary, the material will be tarped to prevent dust emission and/or the spilling of excavated material from belt. Tarps or catchment aprons shall be install on the underside of the conveyor belt where it crosses the Otay River or crosses or borders any salt ponds in areas where there would be the potential for the water and substrate within the ponds to be contaminated by spillage from the conveyor belts.

c. The process shall be continually monitored to ensure that excavated material is not entering any water bodies, including the Otay River and nearby salt ponds. If necessary to protect water quality, additional measures will be implemented to minimize the loss of excavated material from the belt.

Additionally, a soil transport monitoring plan shall be prepared by the construction contractor for review and approval by the Service prior to commencement of soil transport activities. The soil transport monitoring plan shall include operational protocols to ensure that unanticipated spills of transported soil material do not occur from conveyor belt or truck transport operations and monitoring protocols to detect any spills that do occur. The monitoring plan shall also include remediation actions that will be implemented in the event of unintended spill or leakage of excavated material into adjacent wetland areas and salt ponds during soil transport via conveyor belt or truck transport.

Furthermore, to reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 would be implemented. Implementation of these measures would reduce all potentially significant impacts associated with hydrology and water quality to less than significant.

~~**MM-HYD-4**~~ ~~If soil transport between the Otay River Floodplain Site and the Pond 15 Site would be conducted via conveyor belt or slurry pipeline, a soil transport monitoring plan shall be prepared by the construction contractor for review and approval by the Service prior to commencement of soil transport activities. The soil transport monitoring plan shall include monitoring protocols to ensure that unanticipated spills of transported soil material would not occur from conveyor belt or slurry pipeline operations. The monitoring plan shall include what actions will be taken in the event of unintended spill or leakage of soil or slurry material into adjacent wetland areas and salt ponds during soil transport via conveyor belt or slurry pipeline.~~

~~Additionally, to reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 would be implemented.~~

~~Implementation of these measures would reduce all potentially significant impacts associated with hydrology and water quality to less than significant.~~

4.2.5.3.3 Alternative C

Construction-Related Water Quality Impacts

Similar impacts would result from the implementation of Alternative C, as analyzed under Alternative B in Section 4.2.5.3.2. Construction activities would involve the routine use and transport of potentially hazardous materials. MM-HYD-~~2~~3 is provided to reduce impacts associated with unanticipated and/or unintended spills at the site through implementation of a hazardous substance management, handling, storage, disposal, and emergency response plan for all phases of construction.

Additionally, during transport of excavated soil between the Otay River Floodplain Site and the Pond 15 Site, unintended release or spill of soil would have the potential to occur under ~~all three~~both transport options (truck transport~~, transport via conveyor belt,~~ or transport via ~~slurry pipeline~~conveyor belt). Implementation of~~ MM-HYD-3 or~~ MM-HYD-4 would reduce impacts associated with material transport to less than significant.

Moreover, as provided in MM-GEO-1, a SWPPP would prepared that specifies BMPs to be implemented during project construction to prevent pollutants from contacting stormwater and to control erosion and sedimentation. Implementation of the SWPPP during construction would reduce potential impacts associated with the introduction of construction-generated contaminants to nearby water bodies to less than significant.

Sediment Transport and Loading

Based on the technical findings described in Appendix H and as informed by the modeling results, sedimentation rates would be considered low; thus, sedimentation transport resulting from flood events would not result in significant water quality impacts. Therefore, water quality impacts related to sediment loading would be less than significant.

Introduction of Contaminants to Nearby Water Bodies

Similar to Alternative B, large storm events, such as the 100-year flood event, could potentially result in the transportation of existing contaminant sources, or salinity-laden water sources from adjacent salt ponds, to the Otay River Floodplain Site and to a smaller extent, the Pond 15 Site. Although the potential for this occurrence exists, implementation of the proposed action would not exacerbate existing contaminant impacts to nearby water bodies, including those proposed under the proposed action. The Otay River Floodplain Site and Pond 15 Site would be designed, using berm buffers and other protective project features, to protect and isolate the proposed wetland habitats from the introduction of contaminants into the site boundaries. Furthermore, the proposed Otay River Floodplain Site and Pond 15 Site would not be more subject to flooding and associated transportation of contaminants than surrounding water bodies in the area, including the Otay River and the San Diego Bay. These large storm events would occur whether the proposed action is implemented or not; therefore, proposed action implementation would not result in a significant impact related to the transport of existing contaminants to the Otay River Floodplain Site, the Pond 15 Site, or any other nearby water body.

In summary, Alternative C would not violate any water quality standards or waste discharge requirements, substantially increase or contribute to downstream sedimentation, or otherwise substantially degrade existing water quality. Although contaminants from soils in the eastern portion of the Otay River Floodplain Site may erode into and be suspended in floodwaters during a large storm event, implementation of Alternative C would not exacerbate this existing condition, nor would it introduce any additional contaminants to the site or nearby water bodies. Therefore, impacts would be less than significant. To reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 are provided. Following implementation of these measures, impacts associated with erosion, sedimentation, and material transport (and thus, the introduction of contaminants to water bodies) would be less than significant.

Refer to Section 4.2.10 for detailed information regarding contaminant-related impacts, including DDT, under the proposed action.

Mitigation Measures

MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 would be implemented. Implementation of these measures would reduce potentially significant impacts associated with hydrology and water quality to less than significant.

4.2.6 Air Quality

Use of Air Quality Thresholds General Conformity

Implementation of the ORERP would result in direct emissions related to excavation and transport of material within the project site, contouring of the excavated site in preparation for planting, transport of materials to and from the site, and travel to and from the site by contractors, project managers, and monitors. Indirect emissions associated with the long-term maintenance and monitoring of the restoration site would be minimal.

Under the General Conformity regulations, both the direct and indirect emissions associated with a Federal action must be evaluated. Title 40 of the Code of Federal Regulations, Part 93, Subpart B, defines direct emissions as:

> [T]hose emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and originate in a nonattainment or maintenance area and occur at the same time and place as the action and are reasonably foreseeable.

Indirect emissions are defined as follows:

> [T]hose emissions of a criteria pollutant or its precursors:
>
> 1. That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action
> 2. That are reasonably foreseeable
> 3. That the agency can practically control
> 4. For which the agency has continuing program responsibility.

For the purposes of this definition, even if a Federal licensing, rulemaking, or other approving action is a required initial step for a subsequent activity that causes emissions, such initial steps do not mean that a Federal agency can practically control any resulting emissions. However, in this case, the Service would be responsible for long-term maintenance and monitoring of the site and subsequent emissions associated with this activity.

A conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a Federal nonattainment or maintenance area would equal or exceed specified annual emission rates, referred to as "de minimis" thresholds. For ozone (O_3) precursors and particulate matter less than or equal to 10 microns in diameter (PM_{10}), the de minimis thresholds depend on the severity of the nonattainment classification; for other pollutants, the threshold is set at 100 tons per year, as noted in Table 4.2-1.

As indicated in Table 4.2-1, the San Diego Air Basin (SDAB) is designated by the U.S. Environmental Protection Agency as a maintenance area for the 1997 8-hour National Ambient Air Quality Standards (NAAQS) for O_3 and as a marginal nonattainment area for the 2008 8-hour NAAQS for O_3. The western and central portions of the SDAB are designated as a carbon monoxide (CO) maintenance area. The SDAB is in attainment with all remaining NAAQS. The relevant de minimis thresholds for the SDAB are 100 tons per year for volatile organic compounds (VOCs) (an O_3 precursor), oxides of nitrogen (NO_x) (an O_3 precursor), and CO, as shown in Table 4.2-1.

Table 4.2-1
General Conformity De Minimis Thresholds

Criteria Pollutant	Status	Annual (tons/year)
Volatile organic compounds (VOC)	Marginal nonattainment (O_3)	100
Oxides of nitrogen (NO_x)	Marginal nonattainment (O_3)	100
Carbon monoxide (CO)	Attainment/maintenance	100

Source: 40 CFR, Part 93.

San Diego County Air Pollution Control District

As part of its air quality permitting process, the San Diego County Air Pollution Control District (SDAPCD) has established thresholds in Rule 20.2 requiring the preparation of air quality impact assessments for permitted stationary sources. The SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 4.2-2 are exceeded.

Table 4.2-2
SDAPCD Air Quality Significance Thresholds

Construction and Operational Emissions			
	Total Emissions		
Pollutant	*Pounds Per Hour*	*Pounds Per Day*	*Tons Per Year*
Respirable particulate matter (PM_{10})	—	100	15
Fine particulate matter ($PM_{2.5}$)	—	55	10
Oxides of nitrogen (NO_x)	25	250	40
Sulfur oxides (SO_x)	25	250	40
Carbon monoxide (CO)	100	550	100
Volatile organic compounds (VOCs)	—	75*	13.7
Lead and lead compounds	—	3.2	0.6

Sources: SDAPCD Rules 1501 (SDAPCD 1995) and 20.2(d)(2) (SDAPCD 1998).
Notes: * VOC threshold based on the threshold of significance for VOCs from the South Coast Air Quality Management District for the Coachella Valley as stated in the San Diego County Guidelines for Determining Significance.

The thresholds listed in Table 4.2-2 represent screening-level thresholds that can be used to evaluate whether project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the California

Ambient Air Quality Standards (CAAQS) and the NAAQS, including appropriate background levels. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 4.2-2, the proposed action could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

Methodology and Assumptions

Emissions from the construction phase of the project were estimated using the California Emissions Estimator Model (CalEEMod) Version 2013.2.2, available online (www.caleemod.com). For the purposes of modeling, it was assumed that the construction of the proposed action would commence in August 2017 and would be completed in December 2020. Project design includes that all equipment used on site would be Tier 3 engine classification or above except where Tier 3 engines are not available. Construction would occur intermittently over an approximately 2.5-year period, consisting of the following subphases:

- Mobilization (2 months)
- Dewatering of Pond 15 (1 month)
- Earthwork (4 months)
- Shutdown (1 month)
- Core nesting season (no construction activity) (5 months)
- Remobilization (1 month)
- Earthwork (4 months)
- Demobilization (2 months)
- Grading of the Pond 15 Site (4 months)

~~Should the pipeline soil movement option be selected, once all the material from the Otay River Floodplain Site has been pumped to the Pond 15 Site, the material would be left in place until final consolidation has been achieved, which could take up to 5 years, ending construction in December 2024. Construction equipment would include backhoes, loaders, scrapers, bulldozers, dump trucks, and water trucks.~~ It was assumed that an electric generator would be used under the conveyor belt ~~and pipeline construction alternatives~~ alternative to power the mechanisms necessary to move the soil from the Otay River Floodplain Site.

Construction of both action alternatives would require the excavation (cut) of approximately 320,000 cubic yards of soil under Alternative B to 370,000 cubic yards under Alternative C in the Otay River Floodplain Site. Of the cut soil, approximately 260,000 cubic yards under Alternative B to 310,000 cubic yards under Alternative C would be transported to the Pond 15 Site. For the purposes of modeling, it was assumed that approximately 50% of the soil to be transported would be transferred to the Pond 15 Site during the first earthwork construction subphase, which would commence in October 2017. During the second earthwork subphase, which would commence in September 2018, it was assumed the remaining 50% of the soil would be transported to the Pond 15 Site, and the entirety of the Otay River Floodplain Site would be graded.

A detailed depiction of the construction schedule, including information regarding subphases and equipment used during each subphase, is provided in Chapter 2.

Construction equipment and methodology was provided by Everest International Consultants (Appendix E) and equipment mix is meant to represent a reasonably conservative estimate of construction activity. For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week during project construction. Additionally, CalEEMod model defaults were used to determine peak worker trips during construction. For purposes of providing conservative estimates during construction activities, it was assumed peak worker trips would occur during all phases of construction; however, it is anticipated that activities during mobilization and demobilization would require fewer construction workers compared to peak soil transfer activities. Vendor trips were calculated using CalEEMod default trip rates ratios, which are approximately 40% of worker trips for industrial projects (Environ 2013). Construction equipment is conservatively estimated to include scrapers, tractors, loaders, backhoes, and a water truck in addition to haul trucks transporting material between the two project sites. The details are included in Appendix M of this EIS.

The proposed action is subject to SDAPCD Rule 55, Fugitive Dust Control. This rule requires that the project take steps to restrict visible emissions of fugitive dust beyond the property line. Compliance with Rule 55 would limit fugitive dust (PM_{10} and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$)) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least three times daily, resulting in an approximately 61% reduction of particulate matter.

4.2.6.1 Violation of Air Quality Standards

Significance Threshold: Implementation of the proposed action would have a significant direct impact on air quality if the proposed action would result in emissions equal to or in excess of the General Conformity de minimis thresholds as listed in Table 4.2-1 or the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations as listed in Table 4.2-2.

4.2.6.1.1 Alternative A

Under the no action alternative, no grading or other construction activities would occur; therefore, no criteria pollutant emissions would be generated under this alternative, and ambient air conditions would remain similar to existing conditions. As a result, implementation of this alternative would not result in any exceedances in the SDAPCD daily thresholds or General Conformity annual de minimis thresholds; therefore, no significant impacts to air quality are anticipated. The implementation of Alternative A would not result in emissions equal to or in excess of the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations.

Mitigation Measures

No significant impacts related to air quality are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.6.1.2 Alternative B

The implementation of this alternative would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from trucks hauling construction materials and soil from the Otay River Floodplain Site to the Pond 15 Site. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Fugitive dust (PM_{10} and $PM_{2.5}$) emissions would result from ground-disturbing activities, in addition to hauling of material between the Otay River Floodplain Site and the Pond 15 Site and ~~stockpiling of~~ placing material on the ERC site on the eastern portion of the Otay River Floodplain Site. As outlined above, the proposed action is subject to SDAPCD Rule 55, Fugitive Dust Control. To comply with this regulation, fugitive dust control measures are included in the project design, such as watering the site at least three times daily throughout the duration of construction.

NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles. Construction activities would take place over a period of approximately 2.5 years for the truck soil transport and conveyor belt soil transport options~~, and over approximately 7.5 years for the pipeline soil transport option.~~. Trucks trips under the truck soil transport option were calculated based on the amount of soil to be exported to Pond 15, assuming each haul truck would have a 12-cubic-yard soil carrying capacity. The one-way distance from the Otay River Floodplain Site to the Pond 15 Site is approximately 3.5 miles (7 miles round trip). All trips provided in CalEEMod are assumed to be one-way. Truck trip estimates were calculated as follows:

Alternative B – ((260,000 total cubic yards to be exported ÷ 12 cubic yards truck capacity) × 1.3 bulking factor × 2 one-way trips) ÷ (209 days of soil export) =

- 270 one-way trips per day

- 28,167 total one-way trips per earthwork phase
- 56,333 total one-way trips during entire construction period

Alternative C – ((310,000 total cubic yards to be exported ÷ 12 cubic yards truck capacity) × 1.3 bulking factor × 2 one-way trips) ÷ (209 days of soil export) =

- 321 one-way trips per day
- 33,550 total one-way trips per earthwork phase
- 67,100 total one-way trips during entire construction period

Tables 4.2-3 through 4.2-4 ~~5~~ provide estimated emissions that would be generated during construction of the ~~three~~two soil transport options (truck transport~~,~~ and conveyor belt~~, and pipeline~~).

Tables 4.2-3 through 4.2-4 ~~5~~ compare the estimated emissions to the SDAPCD daily thresholds (denoted in pounds per day) and the annual General Conformity de minimis thresholds (denoted in tons per year) for each pollutant. It should be noted that the only criteria pollutant for which the SDAB is a Federal nonattainment area is O_3 (2008 8-hour standard), for which it is classified as a “marginal” nonattainment area, indicating the lowest concentrations of a pollutant within the nonattainment classification (as compared to areas designated as “moderate,” “serious,” “severe,” or “extreme” nonattainment for a particular pollutant). A “marginal” designation thus indicates that an area is close to attainment for that pollutant. For all other criteria pollutants, the SDAB is considered attainment or unclassified under the NAAQS. The basin is currently designated nonattainment for O_3 and particulate matter, PM_{10} and $PM_{2.5}$, under the CAAQS. For all other criteria pollutants, the SDAB is considered attainment or unclassified under the CAAQS.

It should be noted that O_3 is not a primary pollutant (and thus, not a “criteria” air pollutant); it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. O_3 is a colorless gas that is formed in the atmosphere when VOCs, sometimes referred to as reactive organic gases, and NO_x react in the presence of ultraviolet sunlight.

Table 4.2-3
Estimated Construction Emissions –Alternative B: Truck Transport Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	8.49	89.50	139.43	0.20	15.23	9.12
2018	6.61	78.48	129.03	0.18	15.85	8.94
2019	3.27	60.53	73.45	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*8.49*	*89.50*	*139.43*	*0.20*	*15.85*	*9.12*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No

Table 4.2-3
Estimated Construction Emissions –Alternative B: Truck Transport Option

Construction Year	Pollutant (tons/year)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.29	3.31	5.11	0.00	0.71	0.42
2018	0.44	5.19	8.18	0.01	1.33	0.77
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.44*	*5.19*	*8.19*	*0.01*	*1.33*	*0.77*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Notes: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

Table 4.2-4
Estimated Construction Emissions – Alternative B: Conveyor Belt Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	5.32	72.65	86.80	0.16	14.03	8.68
2018	3.59	62.88	77.51	0.14	13.09	8.13
2019	3.27	60.53	73.44	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*5.32*	*72.65*	*86.80*	*0.16*	*14.03*	*8.68*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.17	2.65	3.25	0.00	0.67	0.40
2018	0.25	4.16	5.15	0.00	1.25	0.74
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.25*	*4.16*	*5.15*	*0.00*	*1.2447*	*0.74*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Notes: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

~~Table 4.2-5~~
~~Estimated Construction Emissions – Alternative B: Pipeline Option~~

~~Construction Year~~	~~Pollutant (pounds/day)~~					
	~~*VOC*~~	~~*NO_x*~~	~~*CO*~~	~~*SO_x*~~	~~*PM_{10}*~~	~~*$PM_{2.5}$*~~
~~2017~~	~~14.88~~	~~156.12~~	~~117.27~~	~~0.16~~	~~33.29~~	~~20.47~~
~~2018~~	~~11.59~~	~~127.61~~	~~97.40~~	~~0.14~~	~~31.28~~	~~18.94~~
~~2019~~	~~0.33~~	~~1.60~~	~~4.22~~	~~0.00~~	~~0.57~~	~~0.17~~
~~2020~~	~~9.75~~	~~105.05~~	~~83.35~~	~~0.13~~	~~30.08~~	~~17.74~~
~~*Estimated Emissions (maximum daily)*~~	~~*14.88*~~	~~*156.12*~~	~~*117.27*~~	~~*0.16*~~	~~*33.29*~~	~~*20.47*~~
~~SDAPCD threshold~~	~~75~~	~~250~~	~~550~~	~~250~~	~~100~~	~~55~~
~~Exceed threshold?~~	~~No~~	~~No~~	~~No~~	~~No~~	~~No~~	~~No~~
~~Construction Year~~	~~Pollutant (tons/year)~~					
	~~*VOC*~~	~~*NO_x*~~	~~*CO*~~	~~*SO_x*~~	~~*PM_{10}*~~	~~*$PM_{2.5}$*~~
~~2017~~	~~0.17~~	~~2.65~~	~~3.25~~	~~0.00~~	~~0.67~~	~~0.40~~
~~2018~~	~~0.25~~	~~4.16~~	~~5.15~~	~~0.00~~	~~1.24~~	~~0.74~~
~~2019~~	~~0.01~~	~~0.06~~	~~0.16~~	~~0.00~~	~~0.02~~	~~0.00~~
~~2020~~	~~0.17~~	~~3.17~~	~~3.83~~	~~0.00~~	~~0.68~~	~~0.42~~
~~*Estimated Emissions (maximum annual)*~~	~~*0.25*~~	~~*4.17*~~	~~*5.15*~~	~~*0.00*~~	~~*1.24*~~	~~*0.74*~~
~~De minimis threshold~~	~~100~~	~~100~~	~~100~~	~~N/A~~	~~N/A~~	~~N/A~~
~~Exceed threshold?~~	~~No~~	~~No~~	~~No~~	~~N/A~~	~~N/A~~	~~N/A~~

~~**Source:** See Appendix M for complete results.~~
~~**Note**: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable~~
~~N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.~~
~~Pounds/day – denotes emissions for comparison against SDAPCD thresholds.~~
~~Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.~~

As shown, daily construction emissions would not exceed the thresholds for any of the criteria air pollutants: VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Additionally, criteria pollutants emissions would not exceed the annual General Conformity de minimis thresholds or the daily criteria pollutant thresholds as recommended by the SDAPCD. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative B. Moreover, because the proposed action would be below both the daily SDAPCD thresholds and the annual Federal de minimis thresholds for VOCs and NO_x, the action would not impede the SDAB from coming into attainment for O_3, and impacts associated with O_3 would be less than significant.

Implementation of Alternative B would not result in emissions equal to or in excess of the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations. In addition, the project design would ensure compliance with Rule 55 of the SDAPCD Rules and Regulations to prevent or control fugitive dust emissions. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative B.

Mitigation Measures

No potential significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.6.1.3 Alternative C

The construction-related equipment, schedule, and practices and potential material transport options described in detail within Section 4.2.6.2 for Alternative B would also be implemented under Alternative C. However, an additional 54,000 cubic yards of soil would be transported from the Otay River Floodplain Site to the Pond 15 Site under Alternative C. As a result, the time and equipment needed to excavate and transport the extra material from the Otay River Floodplain Site to the Pond 15 Site, as well as contour grade the Pond 15 Site, would increase. For example, transport of this additional material between the Otay River Floodplain Site and the Pond 15 Site would require an additional 4,500 truck trips to and from the Pond 15 Site, representing an additional 31,500 miles traveled over what is proposed in Alternative B. Tables 4.2-6 through 4.2-7~~8~~ provide estimated emissions for implementing Alternative C under ~~each of the three~~both soil transport options.

Table 4.2-6
Estimated Construction Emissions – Alternative C: Truck Transport Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	9.09	92.72	149.48	0.20	15.47	9.20
2018	7.19	81.46	138.88	0.18	16.39	9.10
2019	3.27	60.53	73.44	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*9.10*	*92.72*	*149.48*	*0.20*	*16.39*	*9.10*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.31	3.44	5.46	0.00	0.72	0.42
2018	0.47	5.39	8.77	0.01	1.35	0.78
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.47*	*5.39*	*8.77*	*0.01*	*1.35*	*0.78*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Note: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

Table 4.2-7
Estimated Construction Emissions – Alternative C: Conveyor Belt Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	5.32	72.65	86.80	0.16	14.03	8.68
2018	3.59	62.88	77.51	0.14	13.09	8.13
2019	3.27	60.53	73.44	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*5.32*	*72.65*	*86.80*	*0.16*	*14.03*	*8.68*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.17	2.65	3.25	0.00	0.67	0.40
2018	0.25	4.16	5.15	0.00	1.25	0.74
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.25*	*4.16*	*5.15*	*0.00*	*1.2447*	*0.74*
De Minimis Threshold	100	100	100	N/A	N/A	N/A
Exceed Threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Note: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

~~Table 4.2-8~~
~~Estimated Construction Emissions – Alternative C: Pipeline Option~~

~~Construction Year~~	~~Pollutant (pounds/day)~~					
	~~*VOC*~~	~~*NO_x*~~	~~*CO*~~	~~*SO_x*~~	~~*PM_{10}*~~	~~*$PM_{2.5}$*~~
~~2017~~	~~14.88~~	~~156.12~~	~~117.27~~	~~0.16~~	~~33.29~~	~~20.47~~
~~2018~~	~~11.59~~	~~127.61~~	~~97.40~~	~~0.14~~	~~31.28~~	~~18.94~~
~~2019~~	~~0.33~~	~~1.60~~	~~4.22~~	~~0.00~~	~~0.57~~	~~0.17~~
~~2024~~	~~9.75~~	~~105.05~~	~~83.35~~	~~0.13~~	~~30.08~~	~~17.74~~
~~*Estimated Emissions (maximum daily)*~~	~~*14.88*~~	~~*156.12*~~	~~*117.27*~~	~~*0.16*~~	~~*33.29*~~	~~*20.47*~~
~~Threshold~~	~~75~~	~~250~~	~~550~~	~~250~~	~~100~~	~~55~~
~~Exceed Threshold?~~	~~No~~	~~No~~	~~No~~	~~No~~	~~No~~	~~No~~
~~**Construction Year**~~	~~**Pollutant (tons/year)**~~					
	~~*VOC*~~	~~*NO_x*~~	~~*CO*~~	~~*SO_x*~~	~~*PM_{10}*~~	~~*$PM_{2.5}$*~~
~~2017~~	~~0.17~~	~~2.65~~	~~3.25~~	~~0.00~~	~~0.67~~	~~0.40~~
~~2018~~	~~0.25~~	~~4.16~~	~~5.15~~	~~0.00~~	~~1.24~~	~~0.74~~
~~2019~~	~~0.01~~	~~0.06~~	~~0.16~~	~~0.00~~	~~0.02~~	~~0.00~~
~~2024~~	~~0.17~~	~~3.17~~	~~3.83~~	~~0.00~~	~~0.68~~	~~0.42~~
~~*Estimated Emissions (maximum annual)*~~	~~*0.25*~~	~~*4.17*~~	~~*5.15*~~	~~*0.00*~~	~~*1.24*~~	~~*0.74*~~
~~De minimis threshold~~	~~100~~	~~100~~	~~100~~	~~N/A~~	~~N/A~~	~~N/A~~

~~Table 4.2-8~~
~~Estimated Construction Emissions – Alternative C: Pipeline Option~~

~~Construction Year~~	~~Pollutant (pounds/day)~~					
	~~VOC~~	~~NO_x~~	~~CO~~	~~SO_x~~	~~PM_{10}~~	~~$PM_{2.5}$~~
~~Exceed threshold?~~	~~No~~	~~No~~	~~No~~	~~N/A~~	~~N/A~~	~~N/A~~

~~**Source:** See Appendix M for complete results.~~
~~**Note**: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.~~
~~N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.~~
~~Pounds/day – denotes emissions for comparison against SDAPCD thresholds.~~
~~Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.~~

As shown, daily construction emissions would not exceed the thresholds for any of the criteria air pollutants: VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Additionally, criteria pollutants emissions would not exceed the annual General Conformity de minimis thresholds or the daily criteria pollutant thresholds as recommended by the SDAPCD. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative C. Moreover, because the proposed action would be below both the daily SDAPCD thresholds and the annual Federal de minimis thresholds for VOC and NO_x, the action would not impede the SDAB from coming into attainment for O_3, and impacts associated with O_3 would be less than significant.

Similarly to Alternative B, implementation of Alternative C would not result in emissions equal to or in excess of the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations. In addition, the project design would ensure compliance with Rule 55 of the SDAPCD Rules and Regulations to prevent or control fugitive dust emissions. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative C.

Mitigation Measures

No significant impacts are anticipated; therefore, no mitigation measures are required.

4.2.6.2 Sensitive Receptors

Significance Threshold: Implementation of the proposed action would have a significant direct impact on air quality if sensitive receptors are exposed to substantial pollutant concentrations, including air toxics such as diesel particulates, or if air contaminants are released beyond the boundaries of the project site; a significant increase in traffic congestion at nearby intersections due to actions associated with the project would represent a significant indirect impact on air quality.

A variety of sensitive receptors surround the general vicinity of the South San Diego Bay Unit of the San Diego Bay NWR, including the San Diego Bay NWR itself. These receptors include a mobile home park located to the south of the Otay River Floodplain in the City of San Diego, residential uses and an elementary school located along the south end of the San Diego Bay in the City of Imperial Beach, residential units scattered among small industrial uses to the east of Pond 15, and residential development located just to the west of the San Diego Bay NWR boundaries in the City of Coronado.

4.2.6.2.1 Alternative A

Under Alternative A, no grading or other construction activities would occur, and no sensitive receptors would be exposed to substantial pollutant concentrations.

Under this alternative, the Otay River Floodplain Site would remain undeveloped, inaccessible to the public, and generate a minimal number of vehicle trips associated with San Diego Bay NWR maintenance activities. Vehicle trips associated with South Bay Salt Works operations would remain consistent with the existing condition. This alternative would not result in any additional trip generation; therefore, this alternative would not result in the formation of CO hotpots. No significant impacts are anticipated.

As such, all impacts for criteria pollutants, toxic air contaminants, CO hotspots, and sensitive receptors would be similar to the proposed action and would not be significant impacts under NEPA.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.6.2.2 Alternative B

Diesel Particulate Matter

With regard to toxic air contaminants and sensitive receptors, diesel exhaust particulate matter would be emitted from heavy equipment and trucks used in the construction and sediment transport process. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions could result in health impacts. Implementation of Alternative B would result in short-term emissions of diesel exhaust from construction equipment, with construction periods generally occurring between September and February during daytime working hours. The types and uses of the diesel fueled equipment would vary over those times. In addition, heavy earthmoving equipment would be sufficiently separated from sensitive receptors to avoid exposure to diesel exhaust. In addition, the timing of trucks leaving the Otay River Floodplain Site to transport material would be set to avoid surface street congestion near the Pond 15 Site, where sensitive receptors are present within approximately 0.4 miles.

Carbon Monoxide Hotpots

In addition to diesel particular matter, project traffic combined with non-project traffic could result in the formation of microscale CO hotspots in the area immediately around points of congested traffic, which could impact surrounding sensitive receptors. If substantial traffic occurs during periods of poor atmospheric ventilation, consists of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SDAB is steadily decreasing (CARB 2004).

Additionally, CO transport is extremely limited and disperses rapidly with distance from the source. Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable level of service. The City of San Diego *California Environmental Quality Act (CEQA) Significance Determination Thresholds* guidance provides screening thresholds and project examples to determine if a site-specific CO hotspots analysis should be performed (City of San Diego 2011). The following are examples of projects that could potentially trigger the need for a site-specific CO hotspots assessment:

- 950 single-family units (9,500 average daily trips) in areas of the City of San Diego where traffic flow is not below (worse than) level of service C and where development is not located within 100 feet of a congested freeway
- 500 single-family units (5,000 average daily trips) where individual residential units contain wood-burning fireplaces that would be used on average 50 days per year

Using the City of San Diego's guidance as a basis for this analysis, the only construction method under the proposed action that would potentially be subject to a CO hotspot assessment would be the haul truck transportation option, because the conveyance method and slurry method would not generate substantial trips such that a CO hotspot assessment would be warranted. Under the haul truck transportation option, it was conservatively estimated that the proposed action would generate approximately 50 construction worker trips and 20 vendor trips or material deliveries per day throughout the construction period. Additionally, approximately 206 one-way truck trips (about 7 miles round-trip; 3.5 miles one-way) per day would be required to transport 129,000 cubic yards of fill material between the Otay River Floodplain Site and the Pond 15 Site during each of the earthwork phases. All construction-related trips would be phased to occur during times that would reduce traffic impacts to surrounding roadways (e.g., construction workers would arrive in the morning before commencement of daily construction activities, material deliveries would be intermittent and only occur when necessary, and haul truck trips would occur steadily throughout the workday). Therefore, the proposed action would generate approximately

276 trips at various times throughout the day under the truck haul transportation option, which would be well below the City's screening threshold of 9,500 trips per day and 5,000 trips per day per the City's screening example, as noted previously.

Moreover, 40 CFR, Part 93.123(c)(5) states, "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site."

Construction of the proposed action would commence in August 2017 and would be completed in December 2020. Because construction of the proposed action is expected to last less than 5 years, construction-related emissions from the action are not considered in the project-level or regional conformity analysis, and a hot-spot analysis is not required for construction of the proposed action. Additionally, although the slurry construction method would extend beyond a 5-year time frame, this method (similar to the conveyance construction method) would not require extensive use of haul trucks that may result in a CO hotspot impact on a local roadway; therefore, a CO hotspot analysis would not be required for either the conveyance construction method or the slurry construction method.

Following completion of the proposed action, San Diego Bay NWR staff and other biological monitors would periodically visit both of the sites as part of ongoing monitoring and management of the restored wetlands. The total number of trips to the project sites would be similar to existing conditions, which are minimal. Therefore, future activities on the site following completion of construction would not result in an increase in trips that could affect air quality. Alternative B would not expose sensitive receptors in the general vicinity of the project site to substantial pollutant concentrations, or result in a significant increase in traffic congestion at nearby intersections.

Mitigation Measures

No significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.6.2.3 Alternative C

Similar to Alternative B with regard to toxic air contaminants and sensitive receptors, diesel exhaust particulate matter generated under Alternative C would be emitted from heavy equipment and trucks used in the construction and sediment transport process. However, under this alternative, construction activity would occur over a longer period, but the intensity of the day-to-day activities would not increase. Therefore, the impacts described under Alternative B would also occur under Alternative C, over an extended period.

Similarly to Alternative B, project traffic combined with non-project traffic could result in the formation of microscale CO “hotspots” in the area immediately around points of congested traffic, which could have a significant impact on surrounding sensitive receptors.

Under the haul truck transportation alternative, it was conservatively estimated that the project would generate approximately 50 construction worker trips and 20 vendor trips or material deliveries throughout the construction period. Implementation of Alternative C would require approximately 249 one-way truck trips (about 7 miles round-trip; 3.5 miles one-way) per day to transport 156,000 cubic yards of fill material proposed between the Otay River Floodplain Site and the Pond 15 Site during each of the two earthwork phases. Therefore, the proposed action would generate approximately 319 trips per day under the truck haul transportation option and would be well below the City of San Diego’s screening threshold of 9,500 trips per day and 5,000 trips per day per the example projects, as noted in Section 4.2.6.2.2.

Construction of the proposed action would commence in August 2017 and would be completed in December 2020. Because construction is expected to last less than 5 years, the proposed action’s construction-related emissions are not considered in the project-level or regional conformity analysis, and a hot-spot analysis is not required for construction of the proposed action.

Therefore, Alternative C would not expose sensitive receptors within the general vicinity of the project site to substantial pollutant concentrations, or result in a significant increase in traffic congestion at nearby intersections.

Mitigation Measures

No significant impacts are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.7 Noise

Significance Threshold: Noise generated by the proposed action that exceeds the affected city’s noise standards at the project’s property line would be considered a significant impact.

The City of San Diego’s noise ordinance, Municipal Code Section 59.5.0404, states that it is unlawful to engage in construction activities between the hours of 7 p.m. of any day and 7 a.m. of the following day, or on legal holidays (City of San Diego 2010). Residential uses south of the San Diego Bay in the City of Imperial Beach have construction noise limits of 75 A-weighted decibels (dBA) for any use, and prohibit construction from 10 p.m. to 7 a.m. Residential uses in the City of Coronado have a construction noise limit of 7 p.m. to 7 a.m.

4.2.7.1 Alternative A

Noise levels on the Otay River Floodplain Site are influenced most heavily by aircraft activity, boating on San Diego Bay, vehicular traffic on I-5 and State Route 75, and pedestrians and bicyclists using the Bayshore Bikeway. Noise levels on the Pond 15 Site are influenced by the South Bay Salt Works operation. Under this alternative, the current uses and activities on the project site would not change; therefore, current noise levels would not increase from the existing conditions. Current operations on the San Diego Bay NWR do not exceed the noise standards of the surrounding municipalities. Therefore, no significant impacts related to noise are anticipated under this alternative.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.7.2 Alternative B

Construction activities proposed under this alternative would result in a temporary increase in ambient noise levels on the project site on an intermittent basis. The noise levels generated by the proposed construction activity would vary greatly depending upon the type of equipment being operated at any one time. The average sound level of the construction activity also depends on the amount of time that the equipment operates and the intensity of construction during that period. Further, the noise level perceived by nearby receptors would vary depending on the distance between the receptor and the noise source(s).

The maximum noise levels for various pieces of construction equipment at a distance of 50 feet are depicted in Table 4.2-9. The *average* sound level at a construction site is typically less than the *maximum* noise level because the various types of equipment operate in alternating cycles of full power and low power, and equipment would be continually moving around the site (i.e., construction equipment would not remain in one place for an extended period). As shown in Table 4.2-9, noise levels generated by heavy construction equipment can range from 80 dBA to 89 dBA when measured at 50 feet.

Table 4.2-9
Construction Equipment Noise Levels

Equipment	Typical Maximum Noise Level (dBA) 50 Feet from Source
Backhoe	80
Compactor	82
Conveyor belt	81
Dozer	85
Grader	85
Loader	85
Scraper	89
Haul trucks	88

Source: FTA 2006.

These noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance (U.S. Department of Labor 2016).

Construction associated with this alternative would involve excavation and redistribution of material at both the Otay River Floodplain Site and the Pond 15 Site. In addition, material would be transported along public streets from the Otay River Floodplain Site to the Pond 15 Site, as indicated on Figure 2-2. The nearest sensitive receptors to the Otay River Floodplain Site are the residential uses located less than 0.1 miles to the southwest (approximately 400 feet from the project boundary). No sensitive receptors occur in proximity to the Pond 15 Site. There are sensitive receptors, including scattered residential units, located on Stella Street and Ada Street, with some units located approximately 150 feet to the east of the proposed haul road route.

Conservatively, if noise levels reach the higher end of the noise spectrum shown in Table 4.2-9 (which represent maximum noise levels) at 89 dBA at 50 feet during construction, and noise levels decrease at a rate of 6 dB per doubling distance as previously stated, approximate noise levels during construction would be as follows: 89 dBA at 50 feet, 83 dBA at 100 feet, 77 dBA at 200 feet, and 71 dBA at 400 feet. Therefore, maximum noise levels at the nearest sensitive receptor would be approximately 71 dBA, which is below the City of San Diego and City of Imperial Beach's noise standard of 75 dBA. Thus, noise levels on the project site could reach up to 93 dBA and noise levels at the nearest sensitive receptor would not exceed the 75 dBA standard. Although construction noise is anticipated to be under 75 dBA at the nearest sensitive receptor, construction BMPs as described in MM-NOI-1 would be implemented during construction activities.

Under Alternative B, the selected contractor would follow both City of San Diego and City of Imperial Beach time restrictions for construction equipment operation, and hauling of material from the Otay River Floodplain Site to the Pond 15 Site would take place Monday through Saturday from 7 a.m. to 7 p.m. Work would not occur on holidays because this is restricted in both cities. Limiting all construction-related activities to these hours would minimize the potential for increased noise levels for sensitive receptors.

In addition, construction activities would be scheduled around the bird nesting season. This is to ensure that noise associated with construction equipment would not affect nesting. For details regarding noise impacts on biological resources, see Chapter 4.3, Biological Resources. The contractor would identify BMPs such as making sure all construction equipment has been maintained and is working properly to reduce construction-related noise, particularly truck noise during material transport. Due to the lack of sensitive receptors within 50 feet, discontinuation of work during the nesting season, and the implementation of BMPs, the construction noise level is anticipated to comply with all applicable noise standards of the surrounding jurisdictions.

Because the proposed construction activity is associated with habitat restoration, once construction has been completed, noises levels on the site would be minimal. The ambient noise level would return to levels less than or equal to the existing conditions. Implementation of Alternative B would not generate noise levels at the property line in excess of the affected city's noise standards during or after construction; therefore, noise impacts would be less than significant. Although construction noise is anticipated to be under 75 dBA at the nearest sensitive receptor, construction BMPs as described in MM-NOI-1 would be implemented during construction activities.

Mitigation Measures

To minimize the potential for noise impacts to sensitive receptors, the following mitigation measure has been incorporated into the scope of the project:

MM-NOI-1

a. Construction plans shall indicate that the hauling of material from the Otay River Floodplain Site to the Pond 15 Site <u>will only be conducted between the hours of 7 a.m. and 7 p.m. Monday through Saturday and </u>is not permitted on Sundays or between the hours of 7 p.m. and 7 a.m<u>. on any day.</u>

b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.

c. Construction noise reduction methods, such as shutting off idling equipment, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools rather than diesel equipment, shall be used.

d. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded from sensitive noise receptors.

e. During construction, ~~stockpiling~~ construction and vehicle staging areas shall be located as far as practical from noise-sensitive land uses.

Implementation of MM-NOI-1 would ensure noise impacts during construction would be less than significant.

4.2.7.3 Alternative C

The potential noise impacts from the implementation of Alternative C would be very similar to those described for Alternative B. Construction would result in increase in ambient noise levels on the project site on an intermittent basis. Under this alternative, the number of daily truck trips traveling back and forth between the Otay River Floodplain Site and the Pond 15 Site to transport material would be higher than under Alternative B. This would result in a marginal increase in noise to sensitive receptors along the haul route. As described under Alternative B, noise levels at the nearest sensitive receptor are anticipated to be below the City of San Diego’s and City of Imperial Beach’s noise standard of 75 dBA; however, should noise levels increase beyond that shown in Table 4.2-9, MM-NOI-1 is provided. Implementation of MM-NOI-1 would reduce noise impacts to a level that is less than significant. Once construction has been completed, noise levels on the site would be minimal. Therefore, the potential for impacts associated with noise would also remain less than significant under Alternative C.

Mitigation Measures

MM-NOI-1, as described under Alternative B, would be implemented under Alternative C.

4.2.8 Climate Change/Sea-Level Rise

Global climate change is a cumulative impact. A project contributes to this potential impact through its incremental GHG production combined with the cumulative increase of all other sources of greenhouse gases (GHGs). Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no noncumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). This approach is consistent with that recommended by the California Natural Resources Agency, which noted in its Public Notice for the proposed CEQA amendments that the evidence indicates in most cases, the impact of GHG emissions should be considered in the context of a cumulative impact, rather than a project-level impact (CNRA 2009).

The Council on Environmental Quality (CEQ) issued Final GHG guidance on August 1, 2016, to assist Federal lead agencies with GHG significance determinations under NEPA associated with Federal actions. The guidance states that CEQ “does not establish any particular quantity of GHG emission as ‘significantly’ affecting the quality of the human environment or give greater consideration to the effects of GHG emissions and climate change over other effects on the human environment" (CEQ 2016). As such, the adopted 2016 CEQ guidance does not specify a numeric threshold under which a proposed project as quantitatively analyzed under NEPA would be considered less than significant. The guidance recommends GHG emissions be quantified and disclosed (if quantification of emissions is feasible) and supplemented with a qualitative analysis of the project's contribution to and effect on global climate change.

Additionally, the State of California has adopted emission-based thresholds for GHG emissions. The Governor's Office of Planning and Research issued a technical advisory titled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*, which states that public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant cumulative climate change impact (OPR 2008).

The following discussion discloses how the proposed alternatives may affect or may be affected by climate change and sea-level rise. This analysis is consistent with the guidance provided in the California Coastal Commission-adopted Sea Level Rise Policy Guidance (Commission 2015), which contains guiding principles for addressing sea-level rise in the coastal zone.

The National Research Council's report titled *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* contains sea-level rise projections for California for three time periods over the coming century for north and south of Cape Mendocino. The regional projections for the area south of Cape Mendocino indicate an increase in sea level between 1.56 and 11.76 inches by 2030, and an increase of between 4.68 and 24 inches by 2050 (NRC 2012). These projections, which are based on global and regional sea-level projections, started with several of the basic scenarios that have been the foundation of the Intergovernmental Panel on Climate Change's climate projections and then combined projections of steric changes (thermal expansion or contraction) with changes in the amount of ocean water due to melting of land-based ice on Greenland and Antarctica, as well as contributions from other land-based glaciers and ice caps. A probable impact of sea-level rise in an estuary setting is a change in tidal dynamics, including changes to the tidal range. The report identified the transition from intertidal mudflat to coastal salt marsh as especially sensitive to changes in sea level.

Significance Threshold: Consistent with the CEQ guidance, the following factors were considered in addressing the impacts of climate change and sea-level rise: (1) the potential impacts of the proposed action on climate change as indicated by its GHG emissions and (2) the ways in which a changing climate over the life of the proposed action may alter the overall environmental implications of the proposed action. For the purposes of assessing climate change/sea-level rise impacts associated with the proposed action, an analysis was conducted to determine the effects of sea-level rise on vegetation communities and habitat quality under both a 4.68-inch and 24-inch rise in sea level for the year 2050.

4.2.8.1 Alternative A

Based on predicted sea-level rise of approximately 4.68 to 24 inches by 2050, little change to the habitat value of either portion of the project site is anticipated. Under Alternative A, the Pond 15 Site would continue to function as a solar salt evaporation pond and would not be affected even with the 24-inch sea-level-rise scenario due to the presence of levees surrounding the pond. Existing berms surrounding the Otay River Floodplain Site would ensure that sea-level rise would not alter the disturbed habitat on site even under a 24-inch sea-level rise scenario.

No impacts associated with climate change/sea-level rise due to implementation of this alternative are anticipated.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.8.2 Alternative B

Per the California Coastal Commission-adopted Sea Level Rise Policy Guidance (Commission 2015) and to comply with Coastal Act Section 30253, the restoration design for the Otay River Floodplain Site and the Pond 15 Site under this alternative has been planned, located, designed, and engineered to address changing sea levels and associated impacts that might occur over the life of the project. In addition, project planning has considered the migration and natural adaptation of the restored wetlands due to future sea-level rise conditions, as described below.

The Otay River Floodplain Site allows for additional sea-level-rise adaptation east of the restoration site as there are no existing or planned landform barriers preventing habitat migration toward I-5 in the San Diego Bay NWR. The Otay River Floodplain Site is more sensitive to sea-level rise than the Pond 15 Site due to the predicted amount of vegetated marsh that shifts to mudflat. Both sites are more dramatically affected by the higher 24-inch sea-level rise where the mid and upper elevations of vegetated marsh are reduced. Table 4.2-10 and Table 4.2-11 show the differences in variation between the habitat types under the sea-level-rise projections. Under the 24-inch sea-level-rise scenario, mudflat and low marsh habitat would increase, but mid-marsh and high vegetated marsh habitat would be reduced. With the increased sea level, overall habitat values would decrease as the subtidal habitat increases.

Table 4.2-10
Alternative B (Intertidal) 24-inch Sea-Level Rise Variation – Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Mudflat, frequently flooded	4.26	14.01
Mudflat, frequently exposed	0.79	2.59
Low salt marsh	8.88	9.81
Mid salt marsh	11.71	3.51
High salt marsh	3.97	0.25
*Total Created Wetland Habitat**	*29.61*	*30.17*
Upland habitat	3.89	3.34
Total*	**33.51**	**33.51**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

Table 4.2-11
Alternative B (Intertidal) 24-inch Sea-Level Rise Variation – Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	10.27	14.20
Mudflat, frequently flooded	16.18	27.56
Mudflat, frequently exposed	2.36	4.33
Low salt marsh	15.58	32.45
Mid salt marsh	34.88	7.54
High salt marsh	5.37	2.25
*Total Created Wetland Habitat**	*84.65*	*88.32*
Upland habitat	6.26	2.58
Total*	**90.90**	**90.90**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

For all possible sea-level rise scenarios, the elevation in which subtidal habitat can occur in the floodplain basin under Alternative B is limited by existing bars, hummocks, and other channel bottom features at the inlet and inside the branch channel into this basin. Under Alternative B, in the event sea level were to rise by 24 inches, a rise in subtidal elevations in Pond 15 would occur. As such, sea-level rise would raise the elevations of all habitat types (Appendix G).

The habitats expected to be supported on the Otay River Floodplain Site under this alternative with 24 inches of sea-level rise, which is currently predicted to occur in about 2050, are shown in Table 4.2-10. On the Pond 15 Site, the habitats anticipated to be supported under this alternative in 2050 are shown in Table 4.2-11. Figure 2-6c through Figure 2-6f characterize the 24-inch sea level rise scenario, and the subsequent impacts of sea-level rise on the Otay River Floodplain Site and Pond 15 Site are consistent with the California Coastal Commission-adopted Sea Level Rise Policy Guidance (Commission 2015).

The impacts of climate change and sea-level rise would not be significant, but they would result in variation in the habitat types proposed for the completion of construction.

Mitigation Measures

No significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.8.3 Alternative C

Potential sea-level rise was also included in the design of the habitat types at both the Otay River Floodplain Site and the Pond 15 Site under Alternative C. The Otay River Floodplain Site is more sensitive to sea-level rise than the Pond 15 Site, as shown in Tables 4.2-12 and 4.2-13.

Tables 4.2-12 and 4.2-13 show the differences in variation in habitat types from the range of projections of sea-level rise. Under the 24-inch sea-level-rise scenario, mudflat and low marsh habitat would significantly increase, but vegetated marsh habitats would be almost completely lost. With the increased sea level, overall habitat values would increase.

Table 4.2-12
Alternative C (Subtidal) 24-inch Sea-Level Rise Variation – Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	4.48	4.48
Mudflat, frequently flooded	4.43	15.04
Mudflat, frequently exposed	2.00	1.48
Low salt marsh	8.34	6.96
Mid salt marsh	6.21	1.99
High salt marsh	3.94	0.36
*Total Created Wetland Habitat**	*29.41*	*30.31*
Upland habitat	4.10	3.20
Total*	**33.51**	**33.51**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

Table 4.2-13
Alternative C (Subtidal) Sea-Level Rise Variation – Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	10.23	14.40
Mudflat, frequently flooded	16.11	24.95
Mudflat, frequently exposed	2.16	2.76
Low salt marsh	12.11	25.78
Mid salt marsh	28.06	17.31

Table 4.2-13
Alternative C (Subtidal) Sea-Level Rise Variation – Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
High salt marsh	14.39	3.08
*Total Created Wetland Habitat**	*83.06*	*88.28*
Upland habitat	7.85	2.63
Total*	**90.90**	**90.90**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

For all possible sea level scenarios, the elevation in which subtidal habitat can occur in the floodplain basin under Alternative C is limited by existing bars, hummocks, and other channel bottom features at the inlet and inside the branch channel into this basin. Under Alternative C, in the event sea level ~~were~~was to rise by 24 inches, a rise in subtidal elevations in Pond 15 would occur. As such, sea-level rise would raise the elevations of all habitat types (Appendix G).

Based on projected increases in sea level, the habitats expected to be supported within the Otay River Floodplain Site under Alternative C in 2050 is shown in Table 4.2-12. The habitats expected to be supported in the Pond 15 Site under Alternative C in 2050 are shown in Table 4.2-13. Figure 2-7c through Figure 2-7f characterize the 24-inch sea level rise scenario, and the predicted impacts of sea-level rise on the Otay River Floodplain and Pond 15 Site under Alternative C are consistent with the California Coastal Commission-adopted *Sea Level Rise Policy Guidance* (Commission 2015).

The impacts of climate change and sea-level rise would not be significant, but they would result in variation in the habitat types proposed for the completion of construction. Impacts relating to implementation of this alternative with respect to affecting climate change are addressed in Section 4.2.9, Greenhouse Gases, of this EIS.

Mitigation Measures

No significant impacts are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.9 Greenhouse Gases

The Service has not developed a quantitative threshold for determining whether a project's GHG emissions would have a significant impact on the environment. Therefore, the determination of whether the level of GHG emissions associated with the proposed action would have a significant impact on the environment involved consideration of the following factors: (1) the extent to which the project would increase or decrease GHG emissions and (2) whether the project complies with applicable regulations, plans, or policies for reducing GHG emissions.

Section 15064.4 of the CEQA Guidelines outlines how to analyze a project's contribution to GHG emission levels, but it does not establish any specific significance thresholds for GHG impacts. The CEQA Guidelines (Section 15064.4(b)) do, however, list factors that a lead agency should consider when assessing the significance of impacts from GHG emissions on the environment. These factors include the following: the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting; whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and the extent to which the project complies with regulations or requirements adopted to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. Other factors can and should be considered as appropriate.

The Council on Environmental Quality (CEQ) issued Final GHG guidance on August 1, 2016, to assist Federal lead agencies with GHG significance determinations under NEPA associated with Federal actions. The guidance states that CEQ "does not establish any particular quantity of GHG emission as 'significantly' affecting the quality of the human environment or give greater consideration to the effects of GHG emissions and climate change over other effects on the human environment" (CEQ 2016). As such, the adopted 2016 CEQ guidance does not specify a numeric threshold under which a proposed project as quantitatively analyzed under NEPA would be considered less than significant. The guidance recommends GHG emissions be quantified and disclosed (if quantification of emissions is feasible) and supplemented with a qualitative analysis of the project's contribution to and effect on global climate change.

The South Coast Air Quality Management District (SCAQMD) adopted an interim significance threshold of 10,000 metric tons of carbon dioxide equivalent (MT CO_2E) per year for industrial projects in December 2008 (SCAQMD 2015). The SCAQMD threshold was adopted after rigorous public vetting. The same threshold value as that adopted by the SCAQMD is also reflected as the "stationary source" threshold in the County of San Diego's Climate Action Plan (CAP) adopted June 2012 (County of San Diego 2012).[1] Subsequently, the County of San Diego, Land Use & Environment Group finalized the *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements – Climate Change*, effective November 9, 2013. These guidelines include a threshold of 10,000 MT CO_2E per year for

[1] The County of San Diego CAP was approved and adopted on June 20, 2012; however, on April 29, 2013, the Superior Court deemed the CAP inadequate and ruled the document was improperly adopted. The updated *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements – Climate Change*, which serves as the supporting documentation for the implementation of the CAP, has been approved, effective November 7, 2013. As such, thresholds and measures described in the CAP as applicable to the project analysis are provided for informational purposes only.

stationary sources (e.g., industrial facilities); however, it is intended to apply primarily to the operational GHG emissions from industrial facilities that include stationary sources, such as boilers, stationary engines, and power generation facilities. Accordingly, this threshold would not be appropriate for evaluating the proposed action's GHG emissions, which are primarily associated with construction. In the absence of a specific GHG threshold that would apply to the proposed action, the significance threshold of 10,000 MT CO_2E/year is used to assess the impacts of the significance of the proposed action's GHG emissions in the absence of a rulemaking to establish a GHG emission threshold of significance. In this instance, the proposed action is analyzed using the SCAQMD threshold because the CEQ, the California Air Resources Board, and the SDAPCD have not yet adopted a numeric threshold.

Emissions from the construction phase of the project, including emissions associated with all construction equipment, were estimated using the CalEEMod Version 2013.2.2, available online (www.caleemod.com).[2] For the purposes of modeling, it was assumed that the construction of the proposed action would commence in August 2017 and would be completed in December 2020. This construction period does not account for the intermittent nature of the schedule (construction would be limited to outside the Service's designated core bird-nesting season) or the significant break between the two earthwork phases. ~~Should the pipeline soil movement option be selected, once all the material from the Otay River Floodplain Site has been pumped to the Pond 15 Site, the material would be left in place until final consolidation has been achieved, which could take up to 5 years, ending construction in December 2024.~~ A detailed depiction of the construction schedule—including information regarding subphases, and equipment used during each subphase is provided in Chapter 2.

Significance Threshold: Impacts are considered significant if the proposed action would exceed the SCAQMD's threshold of 10,000 MT CO_2E per year, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

4.2.9.1 Alternative A

Under Alternative A, no construction activities would occur; therefore, no GHG emissions would be generated under this alternative other than those associated with the vehicle use by the San Diego Bay NWR to continue to maintain and manage the lands on the project site in their current state. As such, implementation of this alternative would not generate GHG emissions in sufficient quantity to contribute to cumulative global climate change impacts. No significant impacts related to GHG emissions would result from implementation of this alternative.

[2] In addition to construction equipment listed in Section 4.2.6, Air Quality, an electric generator would be required to power the conveyor ~~and pipeline~~ operations. Energy use required for generator operations was provided by Everest International Consultants (Lee, pers. comm. 2016).

However, the benefits of carbon sequestration that are associated with coastal salt marsh habitat, as addressed under both action alternatives, would not be realized under this alternative.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.9.2 Alternative B

GHG emissions would be associated with construction of the proposed action through use of construction equipment, an electric generator (for the conveyor ~~and pipeline options~~ option), and vehicle trips. Construction activities would take approximately 2.5 years to complete for the truck soil transport and conveyor belt soil transport options~~, and approximately 7.5 years to complete for the pipeline soil transport option.~~. Tables 4.2-14 through Table 4.2-~~16~~15 provide estimated emissions that would be generated during construction of ~~the three~~ both soil transport options (truck transport~~,~~ and conveyor belt~~, and pipeline~~).

Table 4.2-14
Estimated Construction GHG Emissions: Truck Transport Option

Construction Year	CO_2E Emissions (metric tons per year)
2017	670
2018	1,057
2019	632
Total	**2,359**

Source: See Appendix M for complete results.

Table 4.2-15
Estimated Construction GHG Emissions: Conveyor Belt Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons per year)
2017	Construction Equipment	533
	Generator	761
	2017 Total	*1,294*
2018	Construction Equipment	831
	Generator	761
	2018 Total	*1,592*
2019	Construction Equipment	632
	Total	**3,518**

Source: See Appendix M for complete results.

~~**Table 4.2-16**~~

~~**Estimated Construction GHG Emissions: Pipeline Option**~~

~~Construction Year~~	~~Equipment Type~~	~~CO_2E Emissions (metric tons per year)~~
~~2017~~	~~Construction Equipment~~	~~533~~
	~~Generator~~	~~761~~
	~~*2017 Total*~~	~~*1,294*~~
~~2018~~	~~Construction Equipment~~	~~831~~
	~~Generator~~	~~761~~
	~~*2018 Total*~~	~~*1,592*~~
~~2019~~	~~Construction Equipment~~	~~29~~
~~2020~~	~~Construction Equipment~~	~~596~~
	~~**Total**~~	~~**3,511**~~

~~**Source:** See Appendix M for complete results.~~

As discussed previously, the threshold of 10,000 MT CO_2/year is being used to assess the impact of the proposed action's GHG emissions. The highest total construction emissions under the proposed action in any one year for any of the proposed construction options would equal approximately 1,592 MT CO_2E/year. Therefore, the maximum annual construction-related GHG emissions would be below the SCAQMD suggested threshold of 10,000 MT CO_2/year.

Additionally, due to a small amount of construction activity that would be conducted in the 0.79-acre portion of the Pond 15 Site for the inlet/outlet levee breach, the proposed action would be subject to the Port of San Diego's (Port's) CAP (Port 2013). Implementation of the proposed action would consist of creating wetland habitat and would not include the development of physical structures or other infrastructure that would result in a long-term generation of GHG emissions. Construction activities related to the proposed action would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. As stated previously, construction activities would take approximately 2.5 years to complete for the truck soil transport and conveyor belt soil transport options~~, and approximately 7.5 years to complete for the pipeline soil transport option.~~. As such, GHG emissions generated from the proposed action would primarily occur during construction, thus constituting a short-term, one-time generation of emissions as opposed to the generation of long-term annual operational emissions. For these reasons, implementation of the proposed action would not conflict with or impede implementation of the Port's CAP, nor would implementation of the proposed action impede the Port's ability to meet their 2020 and 2035 reduction targets. Therefore, implementation of the proposed action would be consistent with the Port's CAP and impacts would be less than significant.

Moreover, tidal marshes accumulate and store carbon in their plant matter, roots, and soils, and are recognized for their role in carbon sequestration and carbon storage. The exact amount of carbon stored by these ecosystems is still an active area of research; however, their loss would result in a decrease in sequestration potential (Pendleton et al. 2012). Unlike other carbon-dense ecosystems, tidal wetlands are believed to sequester carbon at dramatically large rates due to high primary productivity, continuous sediment burial, and low organic matter decomposition (Chmura et al. 2003). According to Coverdale et al. 2014, "if preserved, salt marshes are a sustainable solution to curtailing increasing atmospheric carbon." Although this beneficial impact has not been quantified for this alternative, it is important to note that there are potential beneficial impacts associated with implementation of the proposed action.

Mitigation Measures

No significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.9.3 Alternative C

Similar to Alternative B, the GHG emissions generated under Alternative C would be associated with construction of the proposed action through use of construction equipment, an electric generator (for the conveyor ~~and pipeline options~~ option), and vehicle trips. Construction activities would take approximately 2.5 years to complete for the truck soil transport and conveyor belt soil transport options. ~~, and approximately 7.5 years to complete for the pipeline soil transport option.~~ Tables 4.2-17 through Table 4.2-~~19~~18 provide estimated emissions that would be generated during construction of ~~the three~~ both soil transport options (truck transport~~,~~ and conveyor belt~~, and pipeline~~).

Table 4.2-17
Estimated Construction GHG Emissions: Truck Transport Option

Construction Year	CO_2E Emissions (metric tons/year)
2017	695
2018	1,101
2019	632
Total	**2,429**

Source: See Appendix M for complete results.

Table 4.2-18
Estimated Construction GHG Emissions: Conveyor Belt Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons/year)
2017	Construction Equipment	533
	Generator	761
	2017 Total	*1,294*
2018	Construction Equipment	831

Table 4.2-18
Estimated Construction GHG Emissions: Conveyor Belt Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons/year)
	Generator	761
	2018 Total	*1,592*
2019	Construction Equipment	632
	Total	**3,518**

Source: See Appendix M for complete results.

~~**Table 4.2-19**~~
~~**Estimated Construction GHG Emissions: Pipeline Option**~~

~~Construction Year~~	~~Equipment Type~~	~~CO_2E Emissions (metric tons/year)~~
~~2017~~	~~Construction Equipment~~	~~533~~
	~~Generator~~	~~761~~
	~~*2017 Total*~~	~~*1,294*~~
~~2018~~	~~Construction Equipment~~	~~831~~
	~~Generator~~	~~761~~
	~~*2018 Total*~~	~~*1,592*~~
~~2019~~	~~Construction Equipment~~	~~29~~
~~2019~~	~~Construction Equipment~~	~~596~~
	~~**Total**~~	~~**3,511**~~

~~**Source:** See Appendix M for complete results.~~

As discussed previously, the threshold of 10,000 MT CO_2/year is being used to assess the impact of the proposed action's GHG emissions. The highest total construction emissions in any one year for any of the proposed construction options would equal approximately 1,592 MT CO_2E/year. Therefore, the maximum annual construction-related GHG emissions would be below the SCAQMD suggested threshold of 10,000 MT CO_2/year. Similarly to Alternative B, although no quantitative analysis has been prepared, carbon sequestration is a potential beneficial impact associated with implementation of Alternative C.

Additionally, due to the small amount of construction activity that would be conducted in the 0.79-acre portion of the Pond 15 Site for the inlet/outlet levee breach, the proposed action would be subject to the Port's CAP (Port 2013). Implementation of the proposed action would consist of creating wetland habitat and would not include the development of physical structures or other infrastructure that would result in a long-term generation of GHG emissions. As such, implementation of the proposed action would not conflict with or impede implementation of the Port's CAP, nor would implementation of the proposed action impede the Port's ability to meet their 2020 and 2035 reduction targets. Therefore, implementation of the proposed action would be consistent with the Port's CAP and impacts would be less than significant.

Mitigation Measures

No significant impacts are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.10 Contaminants

This section addresses the potential ecological effects associated with the presence of contaminants in the soils and sediments of the project site. Consideration of the effects of food chain uptake of contaminants, particularly in sediments, is an important aspect of the analysis because the primary intended outcome of the proposed action is to provide foraging habitat for benthic organisms, fish, and birds. It is necessary to understand the extent of contamination in tidal and intertidal sediments because sediment-borne contaminants pose a risk to the benthic community and to fish and wildlife that rely on benthic biota for food, especially the Federally endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*) and California least tern (*Sternula antillarum browni*) and Federally threatened western snowy plover (*Charadrius nivosus nivosus*).

Significance Threshold: Adverse effects related to contaminants would be considered significant if the project would create a potential human or biological health hazard, substantially degrade the quality of the environment, and/or impair critical functions (e.g., breeding, foraging) as the result of the transport, use, or disposal of soils or sediments in which contaminants have been identified.

4.2.10.1 Alternative A

As described in Section 3.2.10, Contaminants, both the Otay River Floodplain Site and the Pond 15 Site contain various levels of organic and inorganic contaminants in surface soils or sediments, and in some cases the contamination extends below the surface. Alternative A proposes no disturbance of soils or sediments on the project site; therefore, mobilization of contaminants, particularly DDTs, and/or exposure of organisms to contaminants would be no different than the potential for exposure under existing conditions.

However, there would continue to be the potential for mobilization of contaminants, specifically DDTs, as a result of the erosion of DDT-contaminated soils from the eastern portion of the Otay River floodplain into the Otay River channel and San Diego Bay during a significant flood event. This is a concern because sediment-borne DDT and its metabolites (especially p,p'-DDE) can be toxic to directly exposed benthic organisms, and to indirectly exposed aquatic-dependent wildlife. Sediment-borne DDT and metabolites are known to enter and accumulate in the tissues of aquatic food web organisms. Through bioaccumulation and biomagnification (with trophic transfer), concentrations of DDT and metabolites can reach levels in tissues of aquatic food chain organisms that are unsafe for wildlife that rely on the aquatic biota for food. Deposition flux and deposition thickness simulations following a 100-year flood event under existing site conditions were conducted for Alternative A to determine the fate of soils in the eastern portion of the Otay River floodplain that contain high concentrations of DDT (Appendix I).

Sediment coring data indicate that the depth of erosion in the area of soils containing DDT (portions of the Otay River floodplain located to the east of Nestor Creek) might vary between 1 and 3 feet, and the average concentrations of DDT in the eroded soils could vary between 310 micrograms per kilogram (µg/kg) and 790 µg/kg, depending on the depth of erosion. DDT is hydrophobic and can only be adsorbed and transported by silt and clay fractions in soils. These fine-grained fractions are transported as suspended load (commonly referred to as "wash load"). As floodwaters travel down the Otay River watershed, wash load (estimated at 438,000 cubic yards) from upstream of the project site is expected to mix with the contaminated sediments (at 24,260 to 128,300 cubic yards, depending on erosion depth) in the Otay River floodplain, diluting the concentration of DDTs in the total suspended sediment load. Modeling indicates that under a scenario in which the maximum flood-induced erosion depth of 3 feet in the contaminated area of the Otay River floodplain is mixed with 438,000 cubic yards of fine-grained sediments from upstream erosion of the portion of the watershed below Savage Dam, the dry bulk DDT concentrations everywhere in the post-flood deposition would be 70.2 µg/kg. The initial post-flood suspended sediment concentration is the same in all areas of the floodplain and salt pond complex because the 100-year flood overtops and flows through these areas with its wash load. Various scenarios were modeled, as presented in Appendix I, and the scenario described here (i.e., maximum erosion of 3 feet of contaminated soils) represents the worst-case scenario when assuming the contaminated soils are fully mixed with fine-grained sediments from upstream of the project site.

Three scenarios were also modeled that considered a situation in which no erosion of soils in the portion of the watershed upstream of the Otay River Floodplain Site and below Savage Dam (Lower Otay Lake) would occur. Under these scenarios, DDT deposition would be based on three possible erosion depths (1 foot, 2 feet, and 3 feet) in the DDT-contaminated area of the floodplain; no mixing of upstream sediments was assumed. The dry bulk total amount of DDT in the post-flood deposition under the worst-case scenario (a 3-foot erosion depth) would increase to 310 µg/kg dry weight (dw), while the deposition thickness would be greatly diminished.

The effects under both worst-case scenarios presented above on the recently restored Ponds 10 and 11 for the 100-year flood under the no-project alternative are summarized in Table 4.2-20. Deposition thickness would be similar throughout the Otay River channel, overtopped salt ponds, and southern end of San Diego Bay. As indicated, the final post-flood deposition thickness would be considerably thinner as a result of sediment consolidation.

Table 4.2-20
Sensitivity Analysis of Potential DDT Deposition in Ponds 10 and 11 for Alternative A, Post-100-Year Flood

Scenario	Vol. of Eroded DDT-Bearing Fines	Avg. DDT Conc. in DDT-Bearing Fines	Vol. of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Concentration	Initial Post-Flood Deposition Thickness (200 g/L mud)	Final Post-Flood Deposition Thickness (1,200 g/L mud)	DDT Conc. in Post-Flood Mud Deposition (dry bulk)
Erode top 3 ft Contaminated Area + Upper Watershed	128,300 cy	310 μg/kg	438,000 cy	24,290 AF	23.15 g/L	3.4–3.7 mm	0.5–0.6 mm	70.2 μg/kg
Erode top 3 ft Contaminated Area Only	128,300 cy	310 μg/kg	0 cy	24,290 AF	5.25 g/L	0.74–0.78 mm	0.17–0.18 mm	310 μg/kg

Source: Appendix I.
Notes: **v**ol. = volume; conc. = concentration; g/L = grams per liter; ft = feet; cy = cubic yards; μg/kg = milligrams per kilogram; AF = acre-feet; mm = millimeters.

The potential for impacts to benthic organisms and the prey base for aquatic-dependent wildlife and the potential for bioaccumulation of these compounds to result in impacts on the aquatic-dependent birds that are expected to be supported in the areas affected by post-flood deposition of DDT-bearing fines were also evaluated. In evaluating these concerns, the concentration of DDTs in the deposited materials and how the deposited materials would result in exposure by the benthic organisms were considered. In the short term, while deposited sediments are consolidating, population level impacts to benthic organisms are expected to be limited in nature and extent (Appendix I). Under the worst-case erosion scenario, once post-flood muddy deposits have compacted and consolidated, the DDT concentrations in the top 20 millimeters of muddy sediment are expected to be between the effects range low (ERL) and the effects range median (ERM), and close to the ERL for the top 40 and 80 millimeters of sediment (in consideration of different burrowing depths of different benthic organisms). Therefore, the negative effects are expected to be rare and the final post-flood condition is not likely to have a measurable effect on the prey base for aquatic-dependent species (Appendix I). In regard to the aquatic-dependent birds' exposures to contaminated prey, impacts are unlikely to result from the anticipated deposition of DDT-contaminated sediments following a 100-year flood event (Appendix I).

Mitigation Measures

Impacts under Alternative A would be less than significant; therefore, no mitigation measures are required.

4.2.10.2 Alternative B

Under Alternative B, the western portion of the Otay River floodplain would be excavated, with a portion of the material transported to the Pond 15 Site and the remainder stored on the eastern portion of the Otay River Floodplain Site for future use. In addition, some excavation on the Pond 15 Site would occur to achieve the tidal, intertidal, and upland elevations proposed in the restoration plans. Earthwork associated with construction of the proposed action would redistribute any existing contaminants in the affected soils and sediments. As described in Section 3.2.10, portions of the Otay River floodplain east of Nestor Creek have concentrations of copper, lead, and zinc that appear elevated, compared with soils from west of Nestor Creek. Soils from east of Nestor Creek also have high concentrations of organochlorine pesticides, primarily DDT (Appendix I). To avoid potential adverse effects related to contaminants, initial plans for restoring the Otay River Floodplain Site, as described in Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis, were revised to include only the 30 acres located to the west of Nestor Creek, where no pesticides or polychlorinated biphenyls were detected and concentrations of metals were lower. The revised plans eliminated any proposals for excavation in areas with elevated concentrations of certain metals and high concentrations of DDT, thereby avoiding the potential for risks to aquatic biota and aquatic-dependent wildlife in the restored habitat. However, the 21.5 acres identified on Figure 2-1a east of Nestor Creek would be revegetated to reduce erosion potential in this area.

As noted in Section 3.2.10, contaminant concentrations on the Pond 15 Site are not at levels that would adversely affect habitat quality in the restored pond or the adjacent Bay environment. Under Alternative B, the concentrations of contaminants in Pond 15 sediments, especially when mixed during restoration activities, would be below levels of concern for risk to ecological receptors. Nevertheless, under Alternative B, the total estimated volume of contaminated material (less than 5,000 cubic yards) would be buried in the Pond 15 Site during construction. Once the contaminated sediments are buried as part of the project, a net benefit will result in that contaminated sediment will become less accessible than with pre-project conditions. Therefore, restoration of Pond 15 would have no effect on contaminant levels pond-wide or in San Diego Bay.

The mobilization of contaminants, specifically DDTs, as a result of the erosion of DDT-contaminated soils during a significant flood event, as described under Alternative A, was also considered for Alternative B. In the event of a 50- or 100-year flood event, eroded sediments would be distributed not only in the Otay River channel, Ponds 10 and 11, and other salt ponds overtopped during the flood event, but also in the tidal basin proposed for the western portion of the Otay River floodplain under Alternative B. To better understand the distribution of contaminants during a flood event, the area was evaluated for the effects of both a 50-year flood event and a 100-year flood event on the downstream distribution of eroded soils containing DDT (Appendix I). Because the duration of the 100-year flood is only 24 hours, the analysis assumed that tidal exchange would be quickly reestablished once the floodwaters recede and that the transport and settling dynamics of potentially contaminated silts and clays would be driven and limited by the tidal hydraulics and tidal residence times.

As described in greater detail in Appendix I, the analysis indicated that the post-100-year flood would result in the deposition of less than 1 millimeter to as much as 8 millimeters of partially consolidated mud in the restored tidal basin, with an average dry bulk DDT concentration of 42 µg/kg dw to 790 µg/kg dw, depending on whether the calculations assume the mixing of clean sediments from upstream with the contaminated sediments on the site and on the depth of erosion that occurs. If unmixed with upstream sediments, the DDT concentrations in the muds deposited in the basin could range between 310 µg/kg dw and 790 µg/kg dw, but the deposition thicknesses would reduce to only fractions of a millimeter once these muds become consolidated. Using a depth-proportional exposure approach, and assuming that all exposure occurs within the top 20 millimeters under worst-case conditions, the DDT concentration experienced by the benthic biota would range from approximately 13 µg/kg dw to 29 µg/kg dw initially and would decrease with compaction and consolidation to a final 20-millimeter-based dry bulk concentration of 4.2 µg/kg dw to 7.9 µg/kg dw.

Under the 50-year flood, DDT concentrations would be higher than the comparison results for the 100-year flood because proportionally less erosion would occur in the upper watershed of the Otay River than predicted during a 100-year flood. The post-flood DDT concentrations in the muds (silts and clays) deposited in the tidal basin under the 50-year flood could be as high as 111 µg/kg dw. When no upstream erosion is assumed (worst case), post-flood DDT concentrations in the deposited muds under a 50-year flood are estimated at 790 µg/kg dw, with deposition thicknesses reducing to only fractions of a millimeter once the muds become consolidated. Using a depth-proportional exposure approach within the top 20 millimeters, the DDT concentration experienced by the benthic biota would range from approximately 12 µg/kg dw to 26 µg/kg dw (worst case) initially after the 50-year flood and would decrease with compaction and consolidation to a final 20-millimeter-based dry bulk concentration of 4.0 µg/kg dw to 7.1 µg/kg dw (worst case).

For the 100-year flood, the floodplain tidal basin proposed under Alternative B, which would have a 2-day residence time, would have low peak deposition flux (16.5 tons/acre/day) and a short deposition period (~120 hours). As a result, the tidal basin would accumulate only 3.3 to 3.4 millimeters of partially consolidated mud after 276 hours post-flood. The tidal residence time would be nearly a day longer for the Pond 15 tidal basin, approximately 3.2 days under Alternative B. Consequently, deposition fluxes and thickness would be notably greater than in the floodplain tidal basin. In Pond 15 under Alternative B, the deposition flux would peak at 19.9 tons/acre/day, and the deposition period would be about 150 hours post-flood. Deposition thickness in Pond 15 would be nearly double that expected in the floodplain tidal basin, with an estimated depth of 8.0 millimeters of partially consolidated mud laid down after 276 hours post-flood under Alternative B.

As described under Alternative A, impacts to benthic organisms could occur occasionally during the short term; however, given the likelihood of effects combined with the short-term nature of this condition, population-level impacts are expected to be limited in nature and extent. Once post-flood muddy deposits have compacted and consolidated in the restored areas, the DDT concentrations in the top 20 millimeters of muddy sediment would be very close to the ERL, and even lower for the top 40 millimeters and top 80 millimeters of sediment; therefore, negative effects are expected to be rare. This condition is not likely to have a measurable effect on the prey base for aquatic-dependent species. Further, impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of sediments following either a 100-year or a 50-year flood event. For these reasons, impacts would be less than significant.

Mitigation Measures

Impacts under Alternative B would be less than significant; therefore, no mitigation measures are required.

4.2.10.3 Alternative C

The potential for erosion of the DDT-contaminated soils located to the east of Nestor Creek under Alternative C would be essentially the same as that described under Alternatives A and B; however, the residence time (2.5 days), peak deposition flux (18.3 tons/acre/day), and expected accumulation of partially consolidated mud (3.4 millimeters) after 276 hours post-flood in the deeper Otay River floodplain tidal basin, as proposed under Alternative C in a 100-year flood and assuming upstream erosion of soils, would all be slightly higher than those predicted for Alternative B.

The effects of the 100-year flood in Pond 15 under Alternative C (assuming upstream erosion of soils) are also slightly different from those described under Alternative B. Because more material would be deposited in Pond 15 under Alternative C, storage volume and residence times (3 days) in Pond 15 would be reduced, resulting in slightly less deposition flux (18.9 tons/acre/day) and thickness (7.6 millimeters of partially consolidated mud laid down after 276 hours post-flood).

Under a worst-case scenario in which the calculations for a 100-year flood do not include any upstream erosion of clean sediment and all erosion is calculated from within the project site, the dry bulk total amount of DDT in the post-flood deposition would increase to 310 µg/kg dw, but the deposition thickness would be greatly diminished. The deposition period would be approximately 150 hours with peak deposition flux of 4.1 tons/acre/day, and expected accumulation of partially consolidated mud of 0.77 millimeters after 276 hours post-flood in the deeper Otay River floodplain tidal basin. In Pond 15, peak deposition flux would be 4.3 tons/acre/day, and the expected accumulation of partially consolidated mud is 1.7 millimeters after 276 hours post-flood.

Similar to Alternative B, anticipated DDT concentrations in the Otay River floodplain tidal basin during a 50-year flood when on-site sediments are mixed with clean sediment from upstream would be approximately 110 µg/kg dw. Because the DDT deposition results for the 50-year flood are calculated to be within the range of those for the 100-year flood, potential impacts to the wetland ecology are comparable under both scenarios.

As described under Alternative A, impacts to benthic organisms are expected to be limited in nature and extent. Once post-flood muddy deposits have compacted and consolidated in the restored areas, the DDT concentrations in the top 20 millimeters of muddy sediment would be between the ERL and the ERM, and even lower for the top 40 millimeters and top 80 millimeters of sediment; therefore, negative effects are expected to be rare. Impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of sediments following either a 100-year or a 50-year flood event; therefore, impacts would be less than significant.

Mitigation Measures

Impacts under Alternative C would be less than significant; therefore, no mitigation measures are required.

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4.3 BIOLOGICAL RESOURCES

This section describes the impacts of the Otay River Estuary Restoration Project (ORERP or proposed action) on the habitat and vegetation, wildlife and fisheries, and endangered and threatened species supported on and in the immediate vicinity of the project site. Descriptions of the vegetation communities, plants, wildlife (e.g., birds, mammals, reptiles, and terrestrial and marine invertebrates), fish, and listed and sensitive species for the San Diego Bay National Wildlife Refuge (NWR) are provided and quantified in Section 3.3, Biological Resources.

With the exception of Alternative A (the no action alternative), implementation of the proposed action may result in temporary disturbance and/or permanent loss of vegetation communities and listed or sensitive plant and wildlife species. Temporary disturbance includes short-term impacts associated with construction such as earthwork to create restoration area contours (excavation, grading, and filling), construction of staging areas and new access roads, and improvements to existing access roads. Permanent disturbances include long-term impacts that would remain throughout the life of the proposed action, such as berm installations, levee modifications, and the restoration areas, as described in Chapter 2, Alternatives.

The subtidal and intertidal wetland habitats that would be created under Alternative B or Alternative C are designed to be self-sustaining and are expected to require little maintenance except during initial establishment. Initial maintenance would be limited to ensuring that native plant species installed within low, mid, and high coastal salt marsh elevations, along with areas that will support high tide refugia and native upland vegetation, become established so that they can reproduce and spread naturally, with the goal being creation of self-sustaining native vegetation~~wetland habitats and some upland habitat~~ all supported by natural weather conditions ~~(Appendix C, Final Restoration Plan)~~.

As discussed in Chapter 2, the transitional areas and high tide refugia areas will be an important habitat element integral to the ecological functions~~ality~~ of the restored wetland by providing habitat for light-footed Ridgway's rails and other wading birds. The inclusion of high tide refugia, which is intended to optimally support the rail's full suite of life history needs, will consist of several linear berms and other irregular features that will be slightly higher in the tidal range relative to the elevation range within the bulk of the restoration area. The transitional features will slope from the high salt marsh to approximately 7.8 feet NAVD 88 in elevation. The high tide refugia features will continue to slope from the transitional features, and will provide necessary cover for birds such as the light-footed Ridgway's rails during high tides.

For the purposes of analyzing impacts to biological resources, the project site includes the 33.51-acre Otay River Floodplain Site, the 90.90-acre Pond 15 Site, and additional project features required to facilitate restoration, as illustrated on Figure 2-1a and outlined in detail in Section 2.3.2, Features Common to Both Action Alternatives, of this environmental impact statement

(EIS). Detailed discussions of the proposed action's impacts on biological resources within the project site are provided in this section.

4.3.1 Impacts on Habitat and Vegetation Communities, Including Jurisdictional Wetlands and Waters

For the purposes of this analysis, potential impacts to habitat and vegetation communities are defined as potential impacts to both vegetation communities and jurisdictional wetlands and waters. Direct impacts would result from ground-disturbing activities that remove vegetation or fill jurisdictional waters, and indirect impacts would result from changes to vegetation communities or jurisdictional waters that are incidental to the proposed activities and that could have an impact outside of the project site.

Significance Threshold: An impact to habitat and vegetation would be considered significant if the proposed action would result in the substantial modification of existing habitat or vegetation, including jurisdictional wetlands and waters, within or surrounding the project site.

4.3.1.1 Alternative A

Under Alternative A, no modification of the existing vegetation within the Otay River Floodplain Site, including jurisdictional wetlands and waters regulated by the U.S. Army Corps of Engineers (Corps), would occur, and the existing open water habitat within the Pond 15 Site would remain unchanged. As a result of implementing this alternative, no significant impacts to existing habitat or vegetation on the site would occur. Also under this alternative, the long-term benefits associated with coastal wetland restoration within the Otay River Floodplain Site and restoration of tidal influence to <u>and establishment of a range of coastal wetland habitats, from subtidal to transitional and high tide refugia areas, within </u>the Pond 15 Site would not be realized.

Direct Impacts

Habitat and Vegetation Communities/Jurisdictional Waters

<u>Otay River Floodplain Site</u>

Alternative A would leave vegetation communities and land covers, including jurisdictional wetlands and waters, at the Otay River Floodplain Site in their current state. Periodic maintenance, such as mowing, would continue to occur on the Otay River Floodplain Site in conjunction with ongoing management of the San Diego Bay NWR.

Implementation of Alternative A would not result in any temporary or permanent modification of existing habitat or native vegetation communities. As a result, Alternative A would have no direct, significant impacts on existing habitat or vegetation communities at the Otay River Floodplain Site.

Implementation of Alternative A would not result in any direct permanent impacts to jurisdictional waters associated with the Otay River channel or Otay River Floodplain Site. No regulatory permits from the Corps under Section 404 of the Clean Water Act, the California Coastal Commission (Commission) under the Federal Coastal Zone Management Act, or the Regional Water Quality Control Board (Regional Board) under Section 401 of the Clean Water Act would be required. As a result, Alternative A would have no direct significant or beneficial impacts on jurisdictional wetlands or waters at the Otay River Floodplain Site.

Pond 15 Site

Under Alternative A, the Pond 15 Site would remain a part of the larger solar salt operation, and the existing open water habitat and adjacent levee banks would remain unchanged.

The potential direct and indirect impacts to habitat and vegetation communities and jurisdictional wetlands and waters at the Pond 15 Site would be the same as those described for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port Lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not include any project features; therefore, no direct impacts would occur to habitat or vegetation communities/jurisdictional wetlands or waters.

Indirect Impacts

Habitat and Vegetation Communities/Jurisdictional Waters

Otay River Floodplain Site

No activities would be implemented under Alternative A that would result in temporary or permanent modification of existing native or non-native vegetation communities adjacent to or downstream from the Otay River Floodplain Site. As a result, Alternative A would have no significant indirect impacts on vegetation communities or habitats in the general vicinity of the Otay River Floodplain Site.

Implementation of Alternative A would not result in significant impacts to jurisdictional waters associated with the Otay River channel or Otay River Floodplain Site. No regulatory permits from the Corps under Section 404 of the Clean Water Act, the Commission under the Federal Coastal Zone Management Act, or the Regional Board under Section 401 of the Clean Water Act would be required. As a result, Alternative A would have no significant indirect impacts on jurisdictional wetlands or waters in the general vicinity of the Otay River Floodplain Site.

Pond 15 Site

Under Alternative A, the Pond 15 Site would remain a part of the larger solar salt operation, and the existing open water habitat and adjacent levee banks would remain unchanged.

The potential indirect impacts to habitat, vegetation communities, and jurisdictional wetlands and waters at the Pond 15 Site would be the same as those described for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port Lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not involve any project features; therefore, no indirect impacts would occur to habitat, vegetation communities, or jurisdictional wetlands or waters.

Mitigation Measures

Habitat and Vegetation Communities/ Jurisdictional Waters

No significant direct or indirect impacts on habitat or vegetation communities would result from implementation of Alternative A; therefore, no mitigation measures would be required.

No significant direct or indirect impacts to jurisdictional wetlands or waters would occur under Alternative A; therefore, no mitigation measures would be required.

4.3.1.2 Alternative B

Under Alternative B, habitat restoration activities would require removal of the existing vegetation within a 33.51-acre area in the Otay River Floodplain Site, followed by excavation of this area to achieve elevations capable of supporting intertidal wetland habitat. The excavated material would be used as fill material at the Pond 15 Site to increase the bottom elevation of the pond and allow for a larger area of emergent vegetated coastal salt marsh to be restored than would be possible without the addition of fill soils. The habitat areas within the Otay River Floodplain Site that have been disturbed by past filling and solar salt production would be restored to coastal salt marsh wetlands, and the Pond 15 Site would be restored to tidally influenced subtidal and intertidal wetlands and smaller areas of transitional habitat and high tide refugia. As discussed in Section 2.3, Alternatives Evaluated in Detail, approximately 29.8 acres of intertidal mudflat, coastal salt marsh~~-~~, and transitional habitat, along with approximately 3.7 acres of upland habitat, would be created at the Otay River Floodplain Site (Table 4.3-1). Approximately 86.1 acres of subtidal, intertidal mudflat, coastal salt marsh,, and transitional (occurring from elevation of over +7.8 feet NAVD88), and 3.9 acres of upland habitat would be created at the Pond 15 Site (Table 4.3-1).

~~As discussed in Section 2.3, Alternatives Evaluated in Detail, of this EIS, approximately 30 acres of coastal salt marsh habitat and approximately 3.89 acres of upland habitat would be created at the Otay River Floodplain Site. Approximately 85 acres of coastal salt marsh habitat and mudflat, 6.26 acres of upland habitat would be created at the Pond 15 Site.~~

A mix of native wetland coastal salt marsh plant species would be planted at both sites to create low, mid, and high salt marsh vegetation communities. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 is provided in Table 4.3-1. Tidal hydraulics were analyzed to review the pre-action versus post-action change in Nestor Creek and the Otay River (Appendix G2). The tidal hydraulics modeling results were reevaluated to consider potential proposed action impacts on areas outside the project site, specifically Nestor Creek and the upper reach of the Otay River intertidal zone upriver from the Bayshore Bikeway Bridge. Based on comparisons of hydroperiod functions pre- and post-action, it was concluded that Alternative B would have a negligible effect on tidal inundation in the upper reach of the Otay River and would result in a slight reduction of tidal muting and an improvement in high water tidal inundation of Nestor Creek. Based on the requirements of the Poseidon Resources Marine Life Mitigation Plan (MLMP; Poseidon 2008), the total densities and numbers of species of fish, macroinvertebrates, and birds are required to be similar to those within similar habitat at a reference location within 4 years of construction. Even though the restored habitat may not be fully mature and occupied by wildlife in the first couple of years, it is anticipated to meet the requirements within the first few years after planting.

Table 4.3-1
Proposed Restoration Vegetation Communities for Alternative B – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	— ~~0.00~~	10.36 ~~10.27~~
Mudflat – frequently flooded	4.37 ~~4.26~~	16.42 ~~16.18~~
Mudflat – frequently exposed	0.68 ~~0.79~~	1.95 ~~2.36~~

Table 4.3-1
Proposed Restoration Vegetation Communities for Alternative B – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Low salt marsh	8.96 ~~8.88~~	15.57 ~~15.58~~
Mid salt marsh	11.62 ~~11.71~~	34.88
High salt marsh	3.99 ~~3.97~~	6.24 ~~5.37~~
Transitional	0.15	0.63
*Total Created Wetland Habitat**	*29.77 ~~29.61~~*	*86.06 ~~84.65~~*
~~Upland~~ High Tide Refugia ~~habitat~~	— ~~3.89~~	0.96 ~~6.26~~
Upland	**3.74**	**3.88**
Total*	**33.51**	**90.90**

~~**Source:** Appendix J.~~C
Note: * Totals may not sum precisely due to rounding.

This restoration planning effort also factored in the potential for a 4.68- to 24-inch sea-level rise by 2050 (State of California 2013). For the purpose of complete disclosure, a summary of the habitat configuration and vegetation communities that would be expected based on anticipated 24-inch sea-level rise in 2050 is provided in Table 4.3-2. Regardless of sea-level rise, there would be no decrease in the acreage of the restored wetlands at either site. Figures 2-6a through 2-6d (see Chapter 2, Alternatives) illustrate the proposed restoration based on 2020 and 2050 sea level at the Otay River Floodplain Site and Pond 15 Site.

Table 4.3-2
Proposed Restoration Vegetation Communities for Alternative B – 2050

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	3.94 ~~0.00~~	16.58 ~~14.20~~
Mudflat – frequently flooded	11.56 ~~14.01~~	28.94 ~~27.56~~
Mudflat – frequently exposed	1.96 ~~2.59~~	3.54 ~~4.33~~
Low salt marsh	8.49 ~~9.81~~	30.12 ~~32.45~~
Mid salt marsh	3.87 ~~3.51~~	7.82 ~~7.54~~
High salt marsh	0.32 ~~0.25~~	1.99 ~~2.25~~
Transitional	0.15	1.91
*Total Created Wetland Habitat**	*30.29 ~~30.17~~*	*90.90 ~~88.32~~*
~~Upland~~ ~~High Tide Refugia habitat~~Upland	3.22 ~~3.34~~	— ~~2.58~~
Total*	**33.51**	**90.90**

~~**Source:** Appendix J.~~C.
Note: * Totals may not sum precisely due to rounding.

Direct Impacts

Habitat and Vegetation Communities

Otay River Floodplain Site

Currently, native vegetation communities are limited to small patches of vegetation that have persisted on the 33.51-acre Otay River Floodplain Site. Areas of *Isocoma* (coast golden bush) scrub and southern coastal salt marsh compose approximately 39% (13.23 acres) of the site. The combination of non-native and native vegetation provides habitat for various species of wildlife for foraging, with limited areas suitable for nesting due to the disturbed and open nature of much of the site.

Excavating and dewatering activities associated with preparing the site for coastal wetland restoration in accordance with Alternative B would result in the direct conversion of 29.77~~61~~ acres of existing upland and wetland habitat and disturbed non-native and native vegetation within the Otay River Floodplain Site to wetland communities. Included would be the conversion of 12.33~~30~~ acres of native vegetation (i.e., *Isocoma* scrub and southern coastal salt marsh) to wetlands. Table 4.3-3 provides a summary of the impacts to existing vegetation communities and land cover types at the Otay River Floodplain Site (see Figure 4.3-1, Otay River Floodplain Restoration Site and Project Features Vegetation Impacts). The entire 33.51-acre Otay River Floodplain Site would be permanently impacted for the conversion to native habitats, predominantly wetlands.

Table 4.3-3
Summary of Impacts to Vegetation Communities and
Land Cover Types at the Otay River Floodplain Site for Alternative B

Vegetation Community/Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to Wetlands (acres)	Total Impact (acres)
Brackishwater	—	0.77	0.77
Disturbed habitat	1.65 ~~1.70~~	7.03 ~~6.98~~	8.68
Former salt pond bottom and borrow area	1.19 ~~1.27~~	9.64 ~~9.56~~	10.83
Isocoma scrub	0.89 ~~0.93~~	11.08 ~~11.04~~	11.97
Southern coastal salt marsh	0.01~~—~~	1.25 ~~1.26~~	1.26
Total*	**3.74 ~~3.90~~**	**29.77 ~~29.61~~**	**33.51**

Source: Appendix ~~J~~C.
Note: * Totals may not sum precisely due to rounding.

Although implementation of Alternative B would result in the conversion of existing habitat on the site, the impacted area would ultimately support intertidal wetland vegetation and native upland vegetation, restoring historical wetland habitat values to the entire Otay River Floodplain Site (Tables

4.3-1 and 4.3-2). The restoration would include approximately 24.6 ~~25~~ acres of salt marsh creation, with the balance of the wetlands composed of ~~subtidal or~~ mudflat or transitional habitat.

Restoration in the Otay River Floodplain Site would be limited to the portion of the floodplain located west of Nestor Creek. Within this portion of the Otay River Floodplain Site, the ground would be lowered to elevations suitable to support the target wetland habitats and wetland-associated upland habitats. The Otay River Floodplain Site would be planted with a mix of native wetland vegetation that would mature into low, mid, and high marsh vegetation communities ~~(Appendix C)~~.

The following objectives represent the factors that would contribute to the overall value of the wetland, which are also summarized in the draft Final Restoration Plan (FRP) (Appendix C of the draft EIS). The restoration is anticipated to do the following:

- Provide maximum overall ecosystem benefits, including providing an upland buffer, enhancing downstream fish values, increasing regionally scarce habitat, and improving the local ecosystem diversity. The proposed restoration of the Otay River Floodplain Site would entail the conversion of a former solar evaporation pond to intertidal salt marsh, mudflat, and subtidal habitats. Intertidal salt marsh, intertidal mudflat, and subtidal habitats are regionally scarce habitats targeted for restoration/creation in the Southern California Bight. The proposed restoration has been designed to preserve and enhance biological diversity.
- Provide substantial fish habitat compatible with other wetland values at the site. The conversion of the former evaporation pond to intertidal salt marsh, mudflat, and subtidal habitat would provide substantial fish habitat where none exists today.
- Provide a buffer zone of an average of 300 feet wide, and not less than 100 feet wide, as measured from the upland habitat edge. The Otay River Floodplain Site is located in an isolated corner of south San Diego Bay, with buffers on all sides. The nearest human habitation is 100 feet from the entrance channel to the floodplain restoration; generally, the distance from human habitation is greater than 700 feet. The existing pedestrian trail is from 75 to 125 feet from the restoration site, but would be separated by a flood control levee along the Otay River.
- Provide maximum upland habitat areas (in addition to buffer zones). A gradual transition to upland habitat would be provided to allow for sea-level rise. This zone would provide a substantial area of wetland habitat around the perimeter of the Otay River Floodplain Site.
- Keep adverse impacts to existing functioning wetlands and other sensitive habitats to a minimum. The proposed restoration would entail conversion of a former salt evaporation

pond to intertidal salt marsh, mudflats, and subtidal habitats. The former salt evaporation pond does not contain highly functioning wetlands or other sensitive habitats due to human alteration. Thus, the proposed action would have minimal adverse impacts to existing wetlands and other sensitive habitats.

- Provide site selection and a restoration plan to reflect the consideration of site-specific and regional wetland restoration goals.
- Produce and support wetland-dependent resources. The major goals of the proposed restoration are to protect, manage, enhance, and restore open water, coastal wetlands, and native upland to benefit native fish, wildlife, and plant species supported within the San Diego Bay NWR and to provide habitat for salt-marsh-dependent species.
- Increase the aggregate acreage of wetland in the Southern California Bight. The proposed restoration of the Otay River Floodplain Site would increase the aggregate acreage of tidal wetland.
- Require minimal maintenance. The proposed restoration of the former solar evaporation pond would be accomplished by creating elevations suitable for tidal wetland habitat. Once vegetation has become established, there is no anticipated need for additional planting or for maintenance of exotic weed species.

The foraging function of the upland and disturbed vegetation communities would continue to be provided in the areas designated for upper salt marsh habitat and upland habitat. The impacts of conversion of the existing habitat values on the site would be beneficial by restoring coastal wetland habitat to the Otay River Floodplain Site. As a result, the conversion of the *Isocoma* scrub uplands to tidal wetlands is considered adverse, but less than significant in terms of upland habitat loss and would be beneficial overall~~,~~ in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (1.25 ~~1.26~~ acres) would be temporarily impacted, the restoration would result in a substantial increase in tidal and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 29.77 ~~29.61~~ acres of wetland vegetation. Therefore, there would be a significant beneficial impact due to the restoration of the Otay River Floodplain Site.

Pond 15 Site

Implementation of Alternative B would involve converting open water habitat within an existing solar salt pond to subtidal, intertidal mudflat, and coastal salt marsh habitat by modifying the elevations and contours at the Pond 15 Site. A total of 1.30 acres of land under the jurisdiction of the San Diego Unified Port District (Port) would be impacted as discussed in this section.

Similar to the Otay River Floodplain Site, very limited native habitat and vegetation communities are present on the Pond 15 Site, which currently includes open water habitat associated with a solar salt evaporation pond. Small patches of southern coastal salt marsh and disturbed southern coastal salt marsh compose only 1% (0.97 acres) of the site.

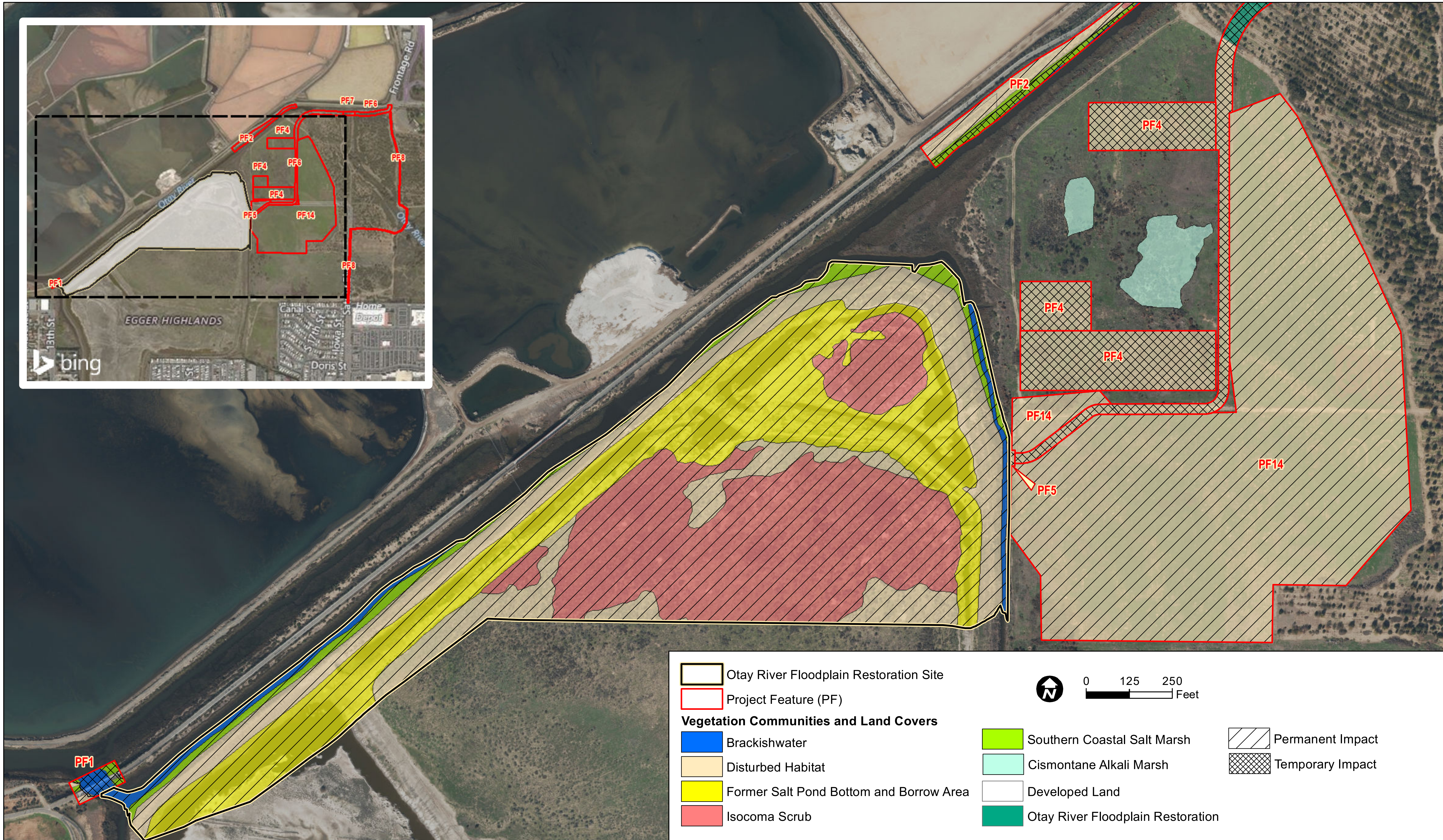
The proposed restoration activities at the Pond 15 Site would result in direct impacts to 90.90 acres of the Pond 15 Site. Construction dewatering, grading, and filling would result in a permanent loss of 82.33 acres of open water habitat in the pond portion of the site, and 0.97 acres of native/natural vegetation communities/land covers along the salt pond levees consisting of southern coastal salt marsh and disturbed southern coastal salt marsh. As a result of the proposed grading, the site would ultimately support native coastal wetland habitat (i.e., subtidal and intertidal wetlands) and native vegetation (i.e., coastal salt marsh). Table 4.3-4 provides a summary of the impacts to existing vegetation communities and land cover types at the Pond 15 Site (see Figure 4.3-2, Pond 15 Restoration Site and Project Features Vegetation Impacts).

Table 4.3-4
Summary of Impacts to Vegetation Communities and Land Cover Types at the Pond 15 Site for Alternative B

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to High Tide Refugia (acres)	Impact for Restoration to Wetlands San Diego Bay NWR (acres)	Impact for Restoration to Wetlands Port Lands (acres)	Total Impact Area (acres)
Bay	—	—	—	1.15	1.15
Beach	—	—	0.01	—	0.01
Disturbed habitat	1.57 ~~2.48~~	—	1.20 ~~0.29~~	—	2.77
Open water	0.34 ~~1.57~~	0.96	81.04 ~~80.76~~	—	82.33
Salt pond levee	1.47 ~~1.65~~	—	2.20 ~~2.02~~	—	3.67
Southern coastal salt marsh	0.48 ~~0.51~~	—	0.23 ~~0.21~~	0.16 ~~0.15~~	0.87
Disturbed southern coastal salt marsh	0.02 ~~0.04~~	—	0.08 ~~0.06~~	—	0.10
Total	**3.88 ~~6.25~~**	**0.96**	**84.76 ~~83.35~~**	**1.30**	**90.90**

Source: Appendix J.

Implementation of Alternative B would result in the modification of existing habitat and native vegetation communities for restoring the historical tidal wetland habitat value in this area to support native plants, fish, and wildlife. Adequate acreage of native habitats would be restored (~~84.65~~ 86.1 acres of coastal wetlands) within the Pond 15 Site to offset the loss of open water and southern coastal salt marsh habitat.



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-1

Otay River Floodplain Restoration Site and Project Features Vegetation Impacts

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AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-2

Pond 15 Restoration Site and Project Features Vegetation Impacts

Otay River Estuary Restoration Project EIS

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The following objectives represent the factors that would contribute to the overall value of the wetland, which are also summarized in the draft F~~f~~inal R~~r~~estoration P~~p~~lan (~~FRP,~~ Appendix C of the draft EIS). The restoration is anticipated to do the following:

- Provide maximum overall ecosystem benefits, including providing an upland buffer, enhancing downstream fish values, increasing regionally scarce habitat, and improving the local ecosystem diversity. The proposed restoration of the Otay River Floodplain Site would entail the conversion of a former solar evaporation pond to intertidal salt marsh, mudflat, and subtidal habitats. Intertidal salt marsh, intertidal mudflat, and subtidal habitats are regionally scarce habitats targeted for restoration/creation in the Southern California Bight. The proposed restoration has been designed to preserve and enhance biological diversity.
- Provide substantial fish habitat compatible with other wetland values at the site. The conversion of the former evaporation pond to intertidal salt marsh, mudflat, and subtidal habitat would provide substantial fish habitat where none exists today.
- Provide a buffer zone of an average of 300 feet wide, and not less than 100 feet wide, as measured from the upland habitat edge.
- Keep adverse impacts to existing functioning wetlands and other sensitive habitats to a minimum. The proposed restoration would entail conversion of a former salt evaporation pond to intertidal salt marsh, mudflats, and subtidal habitats. The former salt evaporation pond does not contain highly functioning wetlands or other sensitive habitats due to human alteration. Thus, the proposed action would have minimal adverse impacts to existing wetlands and other sensitive habitats.
- Provide site selection and a restoration plan to reflect the consideration of site-specific and regional wetland restoration goals.
- Produce and support wetland-dependent resources. The major goals of the proposed restoration are to protect, manage, enhance, and restore open water, coastal wetlands, and native upland to benefit native fish, wildlife, and plant species supported within the San Diego Bay NWR and to provide habitat for salt-marsh-dependent species.
- Increase the aggregate acreage of wetland in the Southern California Bight.
- Require minimal maintenance. The proposed restoration of the former solar evaporation pond would be accomplished by creating elevations suitable for tidal wetland habitat. Once vegetation has become established, there is no anticipated need for additional planting or for maintenance of exotic weed species.

The impacts of converting the existing habitat values on the site would be beneficial by providing restoration of coastal wetland habitat within the Pond 15 Site. The conversion of open water to tidal wetlands is considered adverse but less than significant in terms of habitat loss, and is beneficial overall in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (0.97 acres) would be temporarily impacted, the restoration would result in a substantial increase in tidal and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 86.06 ~~84.65~~ acres of wetland vegetation. Therefore, there would be a significant beneficial impact due to the restoration of the Pond 15 Site.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. A total of 1.15 acres of bay and 0.16 ~~0.15~~ acres of southern coastal salt marsh will be affected (Table 4.3-4 and Figure 4.3-2). The area currently designated as bay will remain as such but will be of greater depth to allow tidal flow between the bay and Pond 15. The area mapped as southern coastal salt marsh will be converted to bay at this location; however, a total of 56.70 ~~55.83~~ acres of low, mid, and high salt marsh would be created in 2020. This habitat is to be established within the San Diego Bay NWR and is illustrated in the FRP. Thus, the impact to the southern coastal salt marsh vegetation community is fully addressed by the FRP.

Project Features

As presented in Chapter 2, the proposed restoration activities focus on the Otay River Floodplain Site and Pond 15 Site. However, several additional project features are required to facilitate the proposed action's restoration activities, including the following (discussed and described in detail in Chapter 2):

1. **Otay Channel Protection under Bikeway Bridge.** The channel protection would be a permanent impact except for the impacts to brackishwater~~,~~ which are temporary.
2. **Otay Channel Protection.** The channel protection would be a permanent impact.
3. ~~**Stockpiles.** Within the proposed staging area, two areas encompassing a total of 4.07 acres would be permanently set aside for stockpiling excavated material.~~
4. **Staging Area.** Implementation of the proposed action would require a site where the logistics of mobilization and demobilization can temporarily occur, as well as where other activities related to the proposed action can be coordinated.
5. **Crossing at Nestor Creek.** To access the western portion of the Otay River Floodplain Site from the staging area east of Nestor Creek, the contractor would install a temporary crossing across Nestor Creek composed of fill material and associated culverts.

6. **Truck Route Connecting Nestor Creek.** The temporary truck construction access route would be used under ~~any three~~ either one of the construction material transfer alternatives.
7. **Crossing at Otay River.** To access the construction staging area and western portion of the Otay River Floodplain Site from the end of Main Street, the contractor would install a temporary crossing at the Otay River channel.
8. **Bike Path Reroute.** An existing bike path that extends north/south between Saturn Boulevard to the south and Main Street to the north would be temporarily rerouted during construction to minimize conflicts between bicyclists and construction vehicles and to ensure user safety.
9. **Crossing at Palomar Channel.** The temporary crossing would be composed of fill material and associated culverts to ensure that the temporary crossing would not create impediments to water flow.
10. **Truck Crossing at Salt Pond Levee.** This would be a temporary impact.
11. **Pond 13 and Pond 14 Levee Modifications.** Permanent modifications in the northern areas of these ponds except for areas that will remain within open water; these will be temporary.
12. **Pond 13 and Pond 14 Levee Modifications.** Permanent modifications in the southern areas of these ponds except for areas that will remain within open water; these will be temporary.
13. **Raised Levee between Pond 22 and Pond 23.** The elevation of the levee that extends for approximately 14,000 feet between Ponds 22 and 23 would be permanently raised by 2 feet to a new crest elevation of +13 feet NAVD 88. This will continue to be used as nesting habitat for western snowy plover.
14. **Exposure Reduction Cover.** The 23.11-acre area east of Nestor Creek would be covered with excess soil from the excavation of the Otay River Floodplain Site and permanently vegetated with native upland vegetation, in accordance with Appendix D, following completion of the proposed action.

    ~~**Revegetation Area East of Nestor Creek.** The 21.5-acre area east of Nestor Creek would be permanently revegetated to native vegetation following completion of the proposed action. Stockpiled material on the staging area would partially be used for this revegetation effort.~~

Similar to the Otay River Floodplain Site and Pond 15 Site, most of the project features would occur on disturbed sites with limited habitat quality, as described in Table 4.3-5 and shown on Figures 4.3-1, 4.3-2, 4.3-3 (Project Features Vegetation Impacts – Otay River Floodplain Vicinity ~~Restoration Site~~), and 4.3-4 (Project Features Vegetation Impacts – Pond 15-Vicinity ~~Restoration Site~~). Small patches of *Isocoma* scrub occur in the vicinity of the Otay channel protection (Project Feature (PF) 2). Small patches of mule-fat scrub occur in the vicinity of the truck route (PF 6). Small patches of southern coastal salt marsh are impacted by the Otay channel protection under the bikeway bridge (PF 1), Otay channel protection (PF 2), two-lane truck route (PF 6), crossing at Otay River (PF 7), crossing at Palomar channel (PF 9), and two-lane truck crossing (PF 10). Freshwater marsh occurs in the vicinity of the temporary crossing of Otay River (PF 7).

Implementation of the project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would result in direct temporary and permanent construction-related impacts to approximately 36.4 ~~40.8~~ acres of vegetation communities and land covers, with a ~~21.50~~ 27.22-acre restoration effort of the staging area and exposure reduction cover upon completion of the proposed action. Table 4.3-5 provides a summary of the impacts to existing vegetation communities and land cover types associated with the project features.

Implementing the project features associated with restoration under Alternative B would result in both permanent and temporary modifications of existing native vegetation communities to increase the overall value of habitat associated with coastal wetland restoration. Although these impacts are part of the beneficial impact of the restoration, the impacts to native habitats are potentially significant; therefore, Mitigation Measure (MM) BIO-1 is provided (see Mitigation Measures in this section). MM-BIO-1 would require the restoration of any temporary project features to pre-construction conditions and require impacted areas to be planted with appropriate native plant species once construction is complete, per the Construction Methods as described in Section 2.3.2.4 and Section 2.4, Alternatives Considered but Eliminated from the Detailed Analysis. MM-BIO-3 would require the restoration of any permanent project features per the FRP.

Table 4.3-5
Summary of Impacts to Vegetation Communities and Land Covers Resulting from Project Features for Alternative B

Vegetation Community/ Land Cover Type	Project Features (acres)													
	1	*2*	~~*3*~~ *4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackishwater	0.13	0.08						0.01						0.22 ~~0.21~~
Developed land	0.02				0.12	0.01	0.74	0.04	0.49					1.42
Disturbed habitat	0.03	0.68	~~4.07~~ 4.11	0.02	1.96 ~~1.87~~	0.07	0.02	0.04	0.30	0.02	0.02	0.41	23.11 ~~21.50~~	30.79 ~~35.11~~
Salt flat									0.06					0.06
Open water									0.40	0.79	0.08	0.03		1.30
Salt pond levee								0.01	0.45	0.19	0.08	0.31		1.04
Otay river floodplain restoration					0.56		0.03							0.59
Freshwater marsh						0.08								0.08
Isocoma scrub		0.06												0.06
Mulefat scrub					0.06									0.06
Southern coastal salt marsh	0.06	0.47			0.02	0.02		0.06	0.19					0.82
Total	**0.24**	**1.29**	**4.11** ~~**4.07**~~	**0.02**	**2.72** ~~**2.63**~~	**0.18**	**0.79**	**0.16**	**1.89**	**1.00**	**0.18**	**0.75**	**23.11** ~~**21.50**~~	**36.44** ~~**40.76**~~

1 Otay Channel Protection under Bikeway Bridge (temporary and permanent)
2 Otay Channel Protection (permanent and temporary)
~~3 Stockpiles (permanent)~~
4 Staging Area (temporary)
5 Crossing at Nestor Creek (temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (temporary)
7 Crossing at Otay River (temporary)
8 Bike Path Reroute (temporary)
9 Crossing at Palomar Channel (temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (temporary)
11 Levee Modification of Ponds 13 and 14 – North (temporary and permanent)
12 Levee Modification of Ponds 13 and 14 – South (temporary and permanent)
13 Raised Levee between Ponds 22 and 23 (permanent)
14 ~~Revegetation Area East of Nestor Creek~~Exposure Reduction Cover (permanent)

Jurisdictional Waters

Otay River Floodplain Site

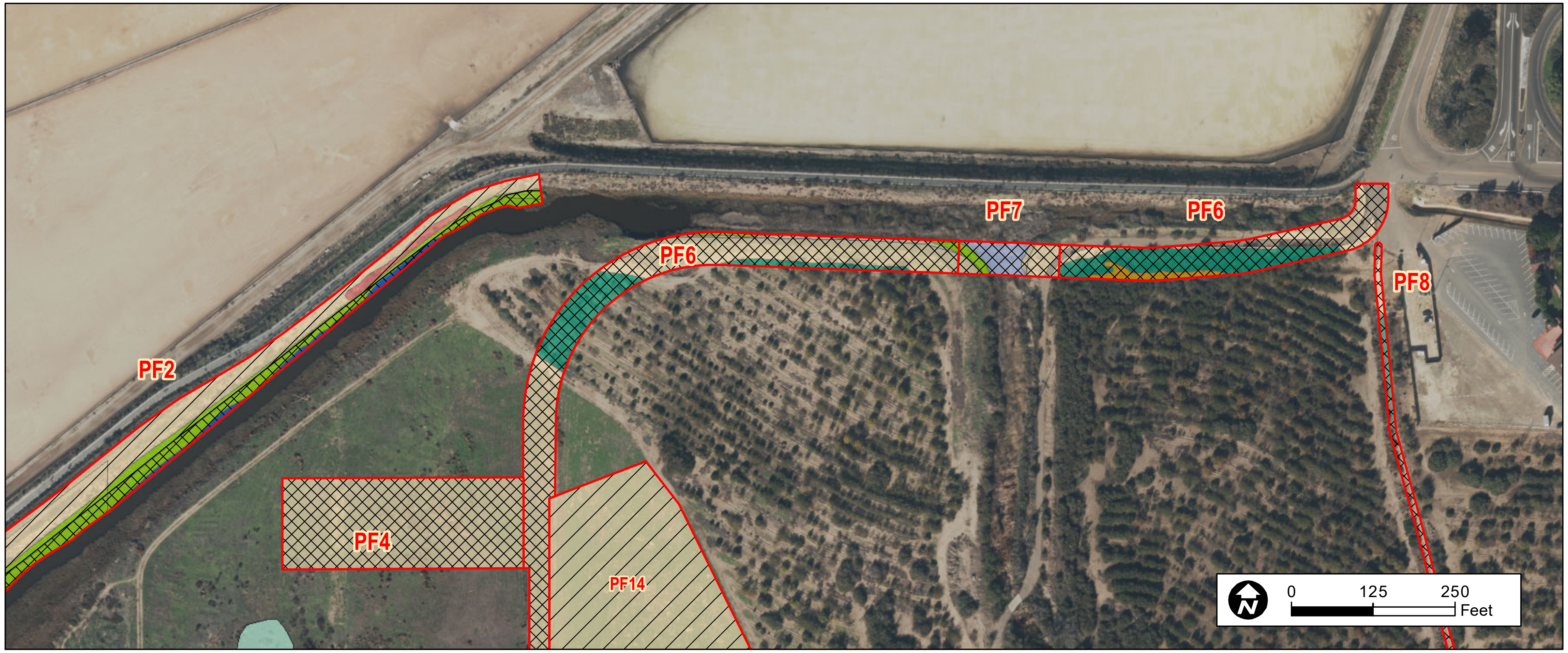
The restoration activities at the Otay River Floodplain Site, as proposed under Alternative B, would result in direct impacts to jurisdictional waters. Approximately 6.43 acres of Corps, Regional Board, and Commission jurisdictional wetlands are present within the 33.51-acre Otay River Floodplain Site. All of these wetlands would be impacted during grading.

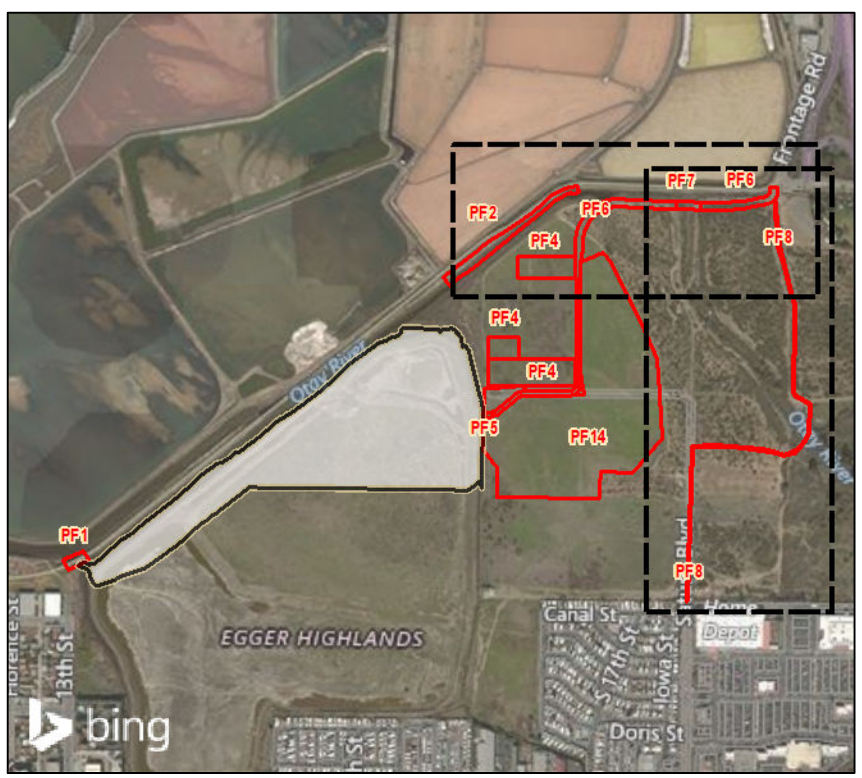
Restoration would result in ~~29.61~~ 29.77acres of jurisdictional wetlands (mudflat, low salt marsh, mid salt marsh, ~~and~~ high salt marsh, and transitional), including 23.93 ~~23.84~~ acres of wetlands created within current upland areas and 5.84 ~~5.77~~ acres of high-quality salt marsh wetland habitat created by recontouring and regrading existing wetlands. This gain in wetland acreage, combined with the expected increased wetland functions that a restored tidal system would provide, represents a beneficial impact. Analysis of the wetland functions is described following Table 4.3.6. Table 4.3-6 provides a summary of the impacts to jurisdictional wetlands and waters at the Otay River Floodplain Site.

Table 4.3-6
Summary of Impacts to Jurisdictional Waters
at the Otay River Floodplain Site for Alternative B

Vegetation Community	Corps, Regional Board, Commission Jurisdiction		
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to Wetlands (acres)*	*Total Impact Area (acres)*
Non-Wetland Waters ~~Wetlands~~			
Brackishwater	—	0.77	0.77
Former salt pond bottom and borrow area	0.53 ~~0.66~~	2.99 ~~2.86~~	3.52
Wetlands			
Southern coastal salt marsh	0.01~~—~~	1.25 ~~1.26~~	1.26
Former salt pond bottom and borrow area	0.05~~—~~	0.82 ~~0.87~~	0.87
Total*	**0.59 ~~0.66~~**	**5.84 ~~5.77~~**	**6.43**

Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.





Otay River Floodplain Restoration Site
Project Feature (PF)

Vegetation Communities and Land Covers

- Brackishwater
- Disturbed Habitat
- Former Salt Pond Bottom and Borrow Area
- Isocoma Scrub
- Permanent Impact
- Temporary Impact
- Southern Coastal Salt Marsh
- Cismontane Alkali Marsh
- Developed Land
- Otay River Floodplain Restoration

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-3

Project Features Vegetation Impacts associated with Otay River Floodplain Restoration Site

Otay River Estuary Restoration Project (ORERP)

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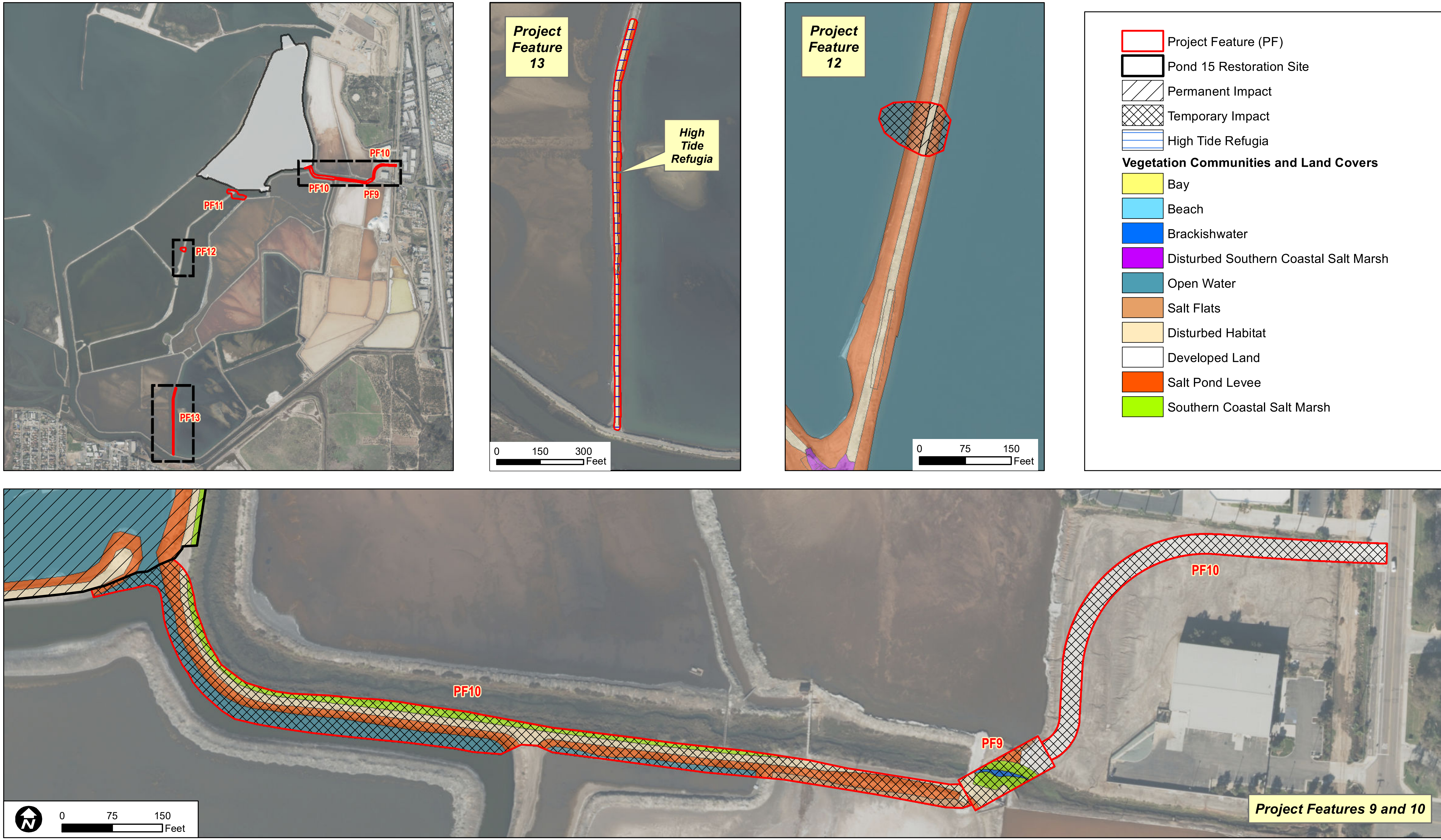

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FIGURE 4.3-4

Project Features Vegetation Impacts associated with Pond 15 Restoration Site

Otay River Estuary Restoration Project EIS

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In support of the conclusion on the benefits of the restoration, a California Rapid Assessment Method (CRAM) Report was prepared by Dudek in 2016 (Appendix E of Appendix J). The CRAM Report presents the results of an assessment of the baseline ecological conditions and the predicted post-action conditions of the wetland resources as a result of the restoration. CRAM was developed as a rapid, scientifically defensible, and repeatable assessment methodology that can be used to assess and monitor the condition of wetlands and riparian habitats. The assessment method is a diagnostic tool that can be used to assess the condition of a wetland or riparian site using visual indicators in the field. Visual indicators are used to choose the best-fit description of habitat condition for a variety of metrics and submetrics within four universal attributes: Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure. The purpose of predicting post-project functions and services is to determine the ecological condition of representative jurisdictional areas within the project site relative to the conditions that are expected after the proposed action is completed.

The Otay River Floodplain Site was analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to have. Per the analysis of the Buffer and Landscape Context attribute, although the site has a buffer, the aquatic area abundance, buffer width, and buffer condition are diminished due to surrounding land use associated with the Bayshore Bikeway, unnatural berms surrounding Pond 20, and historical agricultural uses nearby. The Hydrology attribute scored low due to a combination of urban runoff and groundwater (elevated water table), rather than tidal inundation. The Physical Structure attribute scored low due to a general lack of structural diversity and low topographic complexity as a consequence of the constructed salt pond setting. Per the analysis of the Biotic Structure attribute, the area is primarily unvegetated, and where there is vegetation, it is dominated by non-native species. The vegetation has little biotic structural diversity and very low horizontal interspersion, which is reflected in the low scores for this attribute. In comparison, the post-construction CRAM scores are anticipated to be higher due to the tidal connectivity and the associated cycles of minima and maxima, the construction of complex topography, and the planting of native habitat with incorporation of tidal channels and mudflats. It is anticipated that the site will go from being primarily unvegetated, lacking any tidal flushing, to a functional tidal system with large areas vegetated with salt marsh habitat. The restored areas are expected to be populated by a large diversity and high abundance of fish, birds, and macroinvertebrates indicative of highly functioning intertidal marshes that eventually export productivity to the baywide system rather than acting as a sink (WRA 2013).

Results of the CRAM analysis indicate substantially improved functions and services of aquatic resources would result from the proposed restoration. Further, the pond and associated islands and shorelines are anticipated to provide much greater biologic functions and services (including functions and services specific to wildlife not measured by CRAM) for the target wildlife species compared to the current condition~~ as described in the FRP~~

~~(Appendix C)~~. The results of the CRAM analysis confirm that there will be a substantial improvement of functions and services of jurisdictional wetlands and waters from implementation of the proposed action, given adherence to the primary goal of the FRP (restoration of essential aquatic and salt marsh habitats).

Implementation of Alternative B would permanently impact 5.84 ~~5.77~~ acres of wetland (Table 4.3-6), which would be replaced as described in this section by revegetation of high quality wetlands (see Figure 4.3-5, Otay River Floodplain Restoration Site and Project Features Jurisdictional Impacts). This would result in a potentially significant impact to jurisdictional wetlands; therefore, MM-BIO-2 is provided. MM-BIO-2 requires that the 5.84 ~~5.77~~ acres of wetland that would be converted to other wetlands under Alternative B be mitigated at a minimum of a 1:1 ratio within the combined Otay River Floodplain Site and Pond 15 Site in accordance with the FRP (Appendix C). The impact to 0.53 ~~0.66~~ acres of waters of the United States (former salt pond bottom and borrow area) and 0.06 acres of wetlands (former salt pond bottom and borrow area and southern coastal salt marsh) that would be converted to upland habitat would be a significant impact to jurisdictional wetlands or waters; therefore, MM-BIO-3 is provided. MM-BIO-3 requires that impacts to the 0.59 ~~0.66~~ acres of waters of the United States (including non-wetland and wetland waters) be mitigated at a 4:1 ratio ~~in accordance with the FRP (Appendix C)~~. Following implementation of MM-BIO-2 and MM-BIO-3, impacts would be reduced to less than significant.

Pond 15 Site

The proposed restoration activities at the Pond 15 Site would result in direct permanent impacts to jurisdictional waters associated with the solar salt pond. A total of 88.14 acres of Corps, Regional Board, and Commission jurisdictional wetlands have been delineated within the 90.90-acre Pond 15 Site.

Jurisdictional waters would be affected by filling within the salt pond and removing or otherwise manipulating the earthen salt pond levees. Alternative B would restore~~result in 84.37 acres of~~ jurisdictional wetlands (mudflat, low salt marsh, mid salt marsh, ~~and~~ high salt marsh, and transitional) by recontouring and regrading the 84.86 ~~84.37~~ acres of existing wetlands and waters. This ~~gain in~~conversion to tidal wetland acreage, combined with the expected increased productivity of wetland functions that a restored tidal system would provide, would represent a beneficial impact. A total of ~~the~~ 84.86 ~~84.37~~ acres within Pond 15 (84.39 ~~83.95~~ acres of non-wetland waters and 0.47 ~~0.42~~ acres of wetlands) would be converted to other wetlands under Alternative B~~.~~, and approximately 3.28 ~~3.77~~ acres of waters would be converted to 0.96 acres of high tide refugia and 2.31 acres of upland. Impacts to the 84.86 ~~84.37~~ acres of wetlands or waters are potentially significant; therefore, MM-BIO-2 is provided. MM-BIO-2 requires that mitigation for the conversion of these wetlands and waters to tidal influence be provided at a 1:1 ratio ~~in accordance with the FRP (Appendix C)~~. Impacts to the 3.28 ~~3.77~~ acres of wetlands or waters of the United States that would be converted to upland habitat (2.31 acres) and high tide refugia (0.96 acres) are potentially significant; therefore, MM-BIO-3 is provided. MM-

BIO-3 requires that mitigation for the conversion of wetlands or non-wetland waters to uplands be at a 4:1 ratio~~ in accordance with the FRP (Appendix C~~). Impacts for the conversion of wetlands and non-wetland waters to high tide refugia are required at a 2:1 ratio. The 84.86 ~~84.37~~ acres of predominantly non-wetland waters would be converted to subtidal, intertidal~~,~~ mudflat, ~~and~~ coastal salt marsh, and transitional (Figure 4.3-6, Pond 15 Restoration Site and Project Features Jurisdictional Impacts). Table 4.3-7 provides a summary of the impacts to jurisdictional waters at the Pond 15 Site. This mitigation is accomplished as a combination of the Otay River Floodplain Site and Pond 15 Site. Following implementation of MM-BIO-2 and MM-BIO-3, impacts would be reduced to less than significant.

Table 4.3-7
Summary of Impacts to Jurisdictional Waters at the Pond 15 Site for Alternative B

Vegetation Community/ Land Covers		Corps, Regional Board, Commission Jurisdiction			
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to High Tide Refugia (acres)*	*Impact for Restoration to Wetlands – San Diego Bay NWR (acres)*	*Impact for Restoration to Wetlands – Port Lands (acres)*	*Total Impact Area (acres)*
Bay	—	—	—	1.15	1.15
Beach	—	—	0.01	—	0.01
Open water	0.34 ~~1.57~~	0.96	81.04 ~~80.76~~	—	82.33
Salt pond levee	1.47 ~~1.65~~	—	2.20 ~~2.02~~	—	3.67
Southern coastal salt marsh	0.48 ~~0.51~~	—	0.23 ~~0.21~~	0.16 ~~0.15~~	0.87
Southern coastal salt marsh – disturbed	0.02 ~~0.04~~	—	0.08 ~~0.06~~	—	0.10
Total*	**2.31** ~~**3.77**~~	**0.96**	**83.56** ~~**83.07**~~	**1.30**	**88.14**

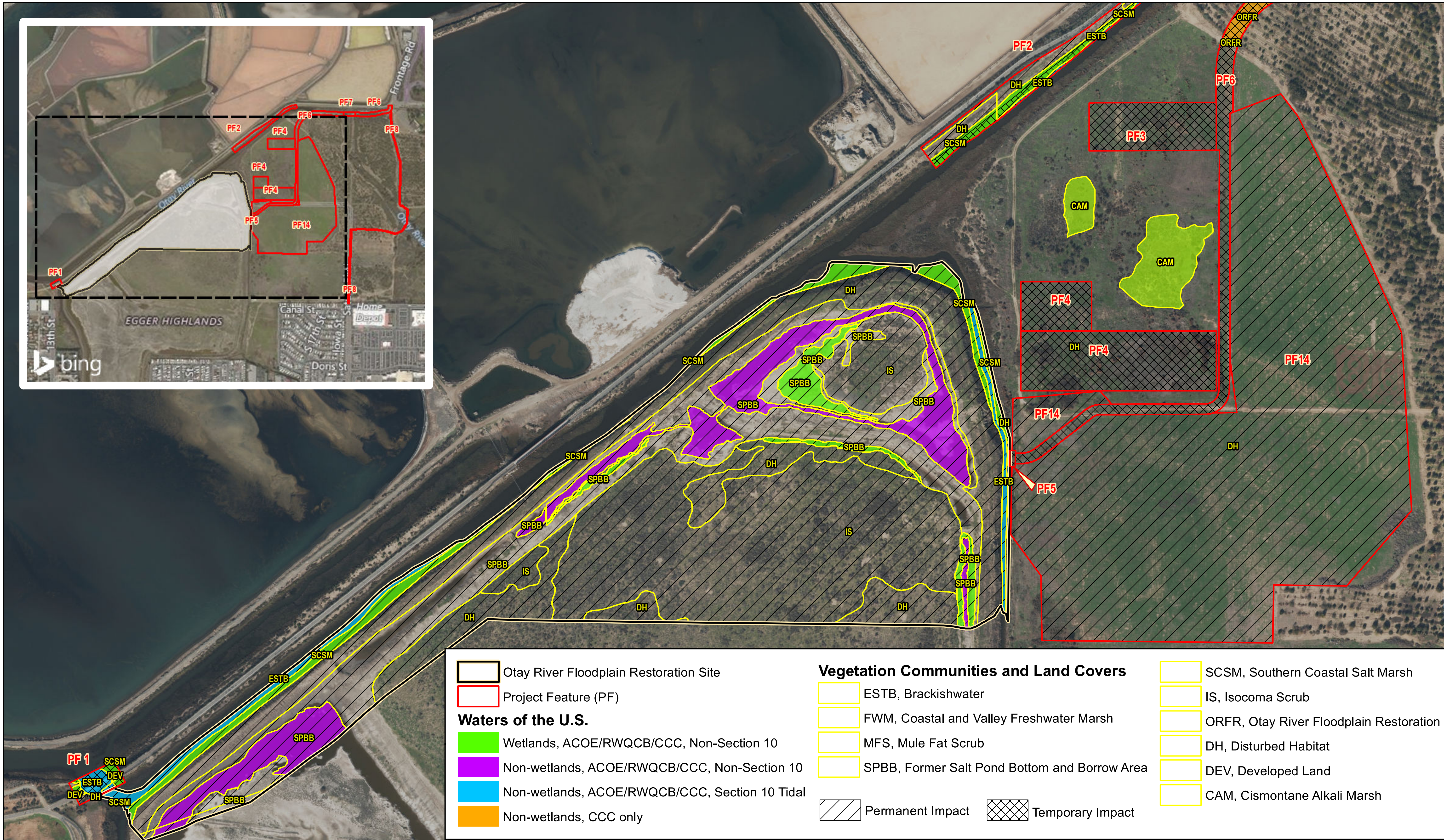
Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.

The Pond 15 Site is an existing industrial solar salt production pond but does have some ecological function for migratory birds. As a result, the applicant undertook a "functional lift" assessment in consultation with the Science Advisory Panel appointed by the Commission. It was determined that for each acre restored to tidal habitat within the Pond 15 Site, 0.75 acres would be applied toward the MLMP requirements. The Pond 15 Site would be restored to tidal marsh using material excavated from the Otay River Floodplain Site and by breaching the levee to introduce tidal action. Currently, the salt evaporator ponds are non-tidal basins containing brines of varying levels of salinity and are used as part of the solar salt production system operated by the South Bay Salt Works. The South Bay Salt Works takes in saltwater from San Diego Bay (Bay), and through a process of sequential evaporation, produces crystalline salt at the plant site. The salt evaporator ponds do not support tidal wetland vegetation, and since salinities in the ponds quickly exceed those tolerable to marine life, the ponds do not support fish or invertebrates typical of or similar to those found in the Bay. The restoration of the Pond 15 Site to intertidal habitats would improve diversity and productivity and provide increased fish production to San Diego Bay.

In support of the conclusion on the benefits of the restoration, a CRAM Report was prepared (Appendix E of Appendix J), as described in more detail previously. Similar to the Otay River Floodplain Site, the Pond 15 Site was analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to have. Dudek evaluated the site from the perspective of the functions and services expected or anticipated after the passage of several years (e.g., 5 years) following construction of the proposed action to allow for the establishment of vegetation on the Pond 15 Site following the large-scale disturbances resulting from construction. Extensive areas are currently barren or open water, lacking any vegetation at all; that condition is expected to change following construction.

The Pond 15 Site was analyzed for a suite of variables that pertain to common attributes for estuarine systems, similar to the analysis conducted for the Otay River Floodplain Site. The Buffer Width score was high due to the CRAM guidelines that allow for the extension of buffer measurements into open water in situations where there is a buffer between the site and the open water. The overall score for Buffer and Landscape Context was slightly diminished due to surrounding land use associated with the salt pond operations and periodic maintenance of the perimeter berms. The Hydrology attribute scored low due to the constructed berms surrounding the area, preventing a natural tidal connection. Hydrology at the site is due to manually operated tide gates that route water through the evaporative salt pond cycle, rather than to natural tidal inundation. There are no freshwater sources from upstream, and no natural tidal connection that affects the hydrology. The Physical Structure attribute scored low due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting. The area is primarily unvegetated. There are a few small patches of vegetated land on the inside slope of the berm, dominated by non-native plant species. Biotic structural diversity and horizontal interspersion are very low, resulting in low scores on the Biotic Structure attribute.

In comparison, the post-construction CRAM scores are anticipated to be higher. The Pond 15 Site would continue to have a buffer that would extend well beyond the edge of the site. Incorporating tidal connectivity into design of the proposed action would improve the Hydroperiod and Hydrologic Connectivity metrics. The FRP indicates that the site would be constructed to experience a full tidal exchange (Appendix C). The Physical Structure attribute score would be substantially increased due to the incorporation of topographic complexity (swales and channels) into the restoration design. The area is expected to be primarily vegetated with native habitat in the post-construction condition, with intervening tidal channels and mudflats. The Biotic Structure score is expected to be substantially improved with the proposed restoration design, with an array of habitats corresponding to the elevational gradient from subtidal to upper salt marsh. Improved scores are expected considering that the Pond 15 Site would go from being a salt evaporator pond lacking any tidal flushing to a functioning tidal system with large areas vegetated with salt marsh habitat.



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-5

Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation Impacts

Otay River Estuary Restoration Project (ORERP)

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FIGURE 3.3-6

Pond 15 Restoration Site and Project Features Jurisdictional Delineation Impacts

Otay River Estuary Restoration Project EIS

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The balance of functions and services related to wildlife are carefully evaluated in the Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan (WRA 2013). The restored areas are expected to be populated by a large diversity and high abundance of fishes, birds, and macroinvertebrates indicative of highly functioning intertidal marshes that eventually export productivity to the baywide system rather than acting as a sink (WRA 2013).

Results of the analysis for the Pond 15 Site indicate that substantially improved functions and services of aquatic resources would result. Further, the ~~ponds~~wetlands, high tide refugia, and associated ~~islands and~~ shorelines are anticipated to provide much greater biologic functions and services for the target wildlife species compared to the current condition or future condition absent the proposed action, as described in the FRP. The results of the CRAM analysis for the Pond 15 Site confirm that there would be a substantial improvement of the functions and services of wetlands and waters due to implementation of the proposed action.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands that are jurisdictional resources are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. A total of 1.15 acres of bay and 0.16~~5~~ acres of southern coastal salt marsh wetlands will be affected (Table 4.3-4 and Figure 4.3-6). The area currently designated as bay will remain as such but will be of greater depth to allow tidal flow between the bay and Pond 15. The area mapped as southern coastal salt marsh will be converted to bay at this location; however, a total of 56.70 ~~55.83~~ acres of low, mid, and high salt marsh would be created in 2020. This habitat is to be established within the San Diego Bay NWR as wetlands and is illustrated in the FRP. Thus, the impact to the southern coastal salt marsh and bay vegetation communities are fully addressed by the FRP.

Jurisdictional Impacts Summary

Total restoration within the Pond 15 Site and Otay River Floodplain Site would provide 115.83 ~~114.26~~ acres of jurisdictional wetlands, including native habitat and coastal salt marsh vegetation as well as mudflat and transitional habitat for foraging and ecotonal diversity. As noted in this section and within MM-BIO-2 and MM-BIO-3, a mitigation ratio of 4:1 would be provided for the 2.90 ~~4.43~~ acres of wetlands and waters that would be impacted and converted to upland habitat (0.59 ~~0.66~~ acres for the Otay River Floodplain Site and 2.31 acres ~~3.77 acres~~ for the Pond 15 Site). In addition, a mitigation ratio of 2:1 would be provided for the jurisdictional impacts to 0.96 acres of wetlands and waters that would be impacted and converted to high tide refugia at the Pond 15 Site. A mitigation ratio of 1:1 is provided for the jurisdictional impacts of 90.70 ~~90.14~~ acres of wetlands converted to tidal wetlands (5.84 ~~5.77~~ acres for the Otay River Floodplain Site and 84.86 ~~84.37~~ acres for the Pond 15 Site). The mitigation ratios have been deemed appropriate by the Corps because the restoration of coastal wetland habitat would represent a direct beneficial impact on vegetation communities at the Pond 15 Site. A summary of the impacts and proposed mitigation is provided in Table 4.3-8.

Table 4.3-8
Determination of Mitigation Acreage Requirement for Impacts to Jurisdictional Resources

Site	Impact	Mitigation Ratio	Required Mitigation Acreage
Otay River Floodplain Site	5.84 ~~5.77~~ acres conversion of existing wetlands to tidal wetlands	1:1	5.84 ~~5.77~~
Otay River Floodplain Site	0.59 ~~0.66~~ acre conversion of existing wetlands to upland habitat	4:1	2.35 ~~2.64~~
Pond 15 Site	84.86 ~~84.37~~ acres conversion of existing wetlands to tidal wetlands	1:1	84.86 ~~84.37~~
Pond 15 Site	2.31 ~~3.77~~ acres conversion existing wetlands to upland habitat	4:1	9.25 ~~15.08~~
Pond 15 Site	0.96 acres conversion of existing wetlands to high tide refugia	2:1	1.93
Project Features	2.52 ~~1.36~~ acres conversion of existing wetlands to tidal wetlands	1:1	2.52* ~~1.36*~~
Project Features	0.99 ~~0.98~~ acres conversion of existing wetlands to upland habitat	4:1	3.95 ~~3.92~~
Project Features	0.65 ~~0.62~~ acres of Commission-only wetland restored in place	1:1	0.65* ~~0.62*~~
Project Features	0.34 acres conversion of existing wetlands to uplands (Pond 22/23 berm)	4:1	1.36
		Total Required Mitigation Acreage	**109.54** ~~**111.78**~~
		Total Mitigation Acreage Resulting from Restoration (Combined for Otay River Floodplain Site and Pond 15 Site)	**115.83** ~~**114.26**~~

*These acreages are not included in the total because the restoration will be at the location of impact immediately upon completion.

Project Features

Implementation of the project features associated with habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site under Alternative B would result in direct temporary and permanent construction-related impacts to approximately 4.51 ~~3.04~~ acres of jurisdictional waters.

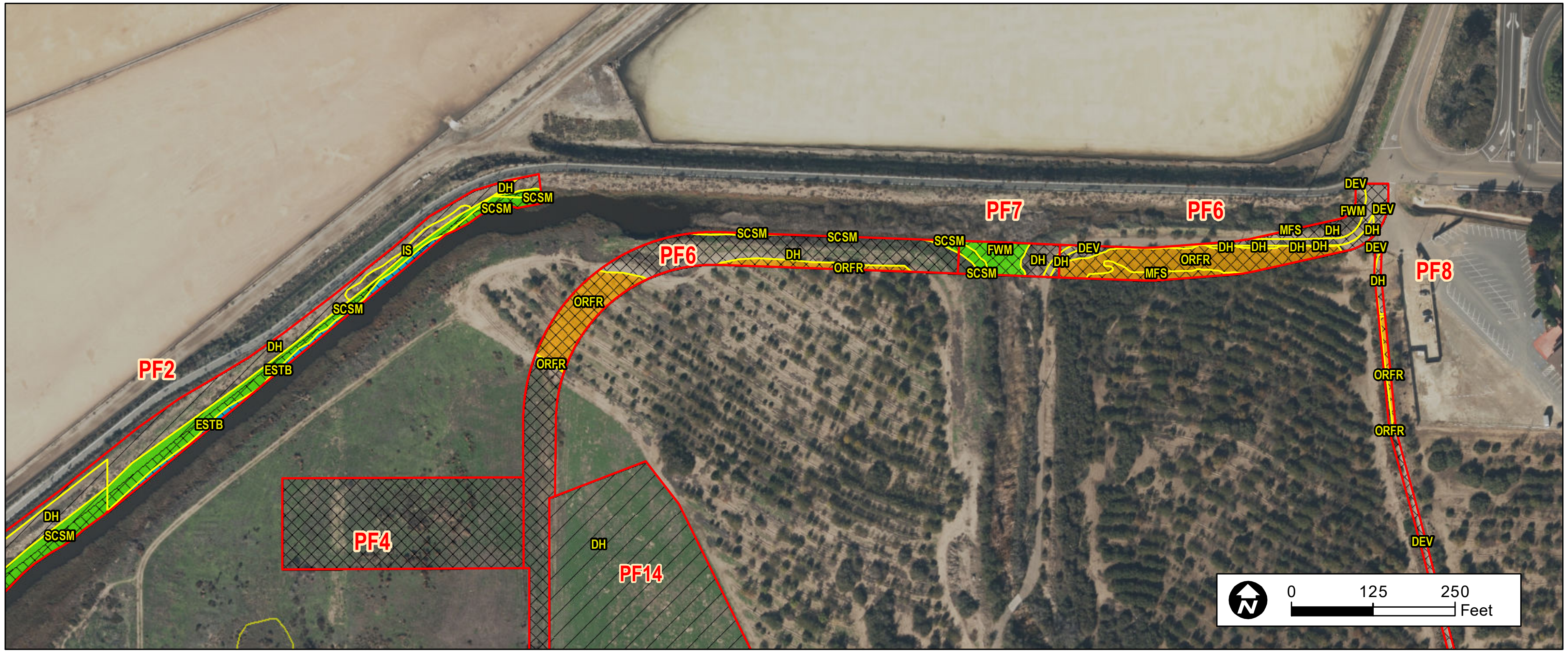
Jurisdictional waters would be affected during construction activities associated with the Otay channel protection under Bikeway Bridge (PF 1), Otay channel protection (PF 2), two-lane truck route connecting Nestor Creek (PF 6), temporary crossing of Otay River (PF 7), bike path reroute (PF 8), crossing at Palomar channel (PF 9), two-lane truck crossing at salt pond levee (PF 10), levee modification of Ponds 13 and 14 – north and south (PF 11 and PF 12), and raised levee between Ponds 22 and 23 (PF 13). The channel protection features and levee modifications would be permanent impacts that will affect most of each of the project feature except for those areas that will remain within the brackishwater habitat. The river and channel crossings, although temporary in function, are also considered permanent impacts by the Corps. All jurisdictional impacts are to combined Corps, Regional Board, and Commission wetlands and waters except for the two-lane truck route connecting Nestor Creek, which would result in temporary impacts to Commission-only jurisdictional wetlands. The Corps, Regional Board, and Commission permanent jurisdictional impacts resulting from channel protection features, levee modifications, crossings, and truck routes would involve the conversion of 3.86 ~~2.34~~ acres of wetlands, 0.99 ~~0.98~~ acres of which would be permanently impacted, 0.34 acres of which would be impacted but then continue to function as nesting for shorebird and seabirds, and 2.52 ~~1.36~~ acres of which would be restored to original condition upon completion of the proposed action. Commission-only jurisdictional impacts would be temporary and total 0.65 ~~0.62~~ acres (Figures 4.3-5, 4.3-6, 4.3-7 (Project Features Jurisdictional Impacts – Otay River Floodplain Restoration Site), and 4.3-8 (Project Features Jurisdictional Impacts – Pond 15 Restoration Site)). Table 4.3-9 provides a summary of the impacts to jurisdictional waters associated with the project features and the summary of the project total impact is provided in Table 4.3-8.

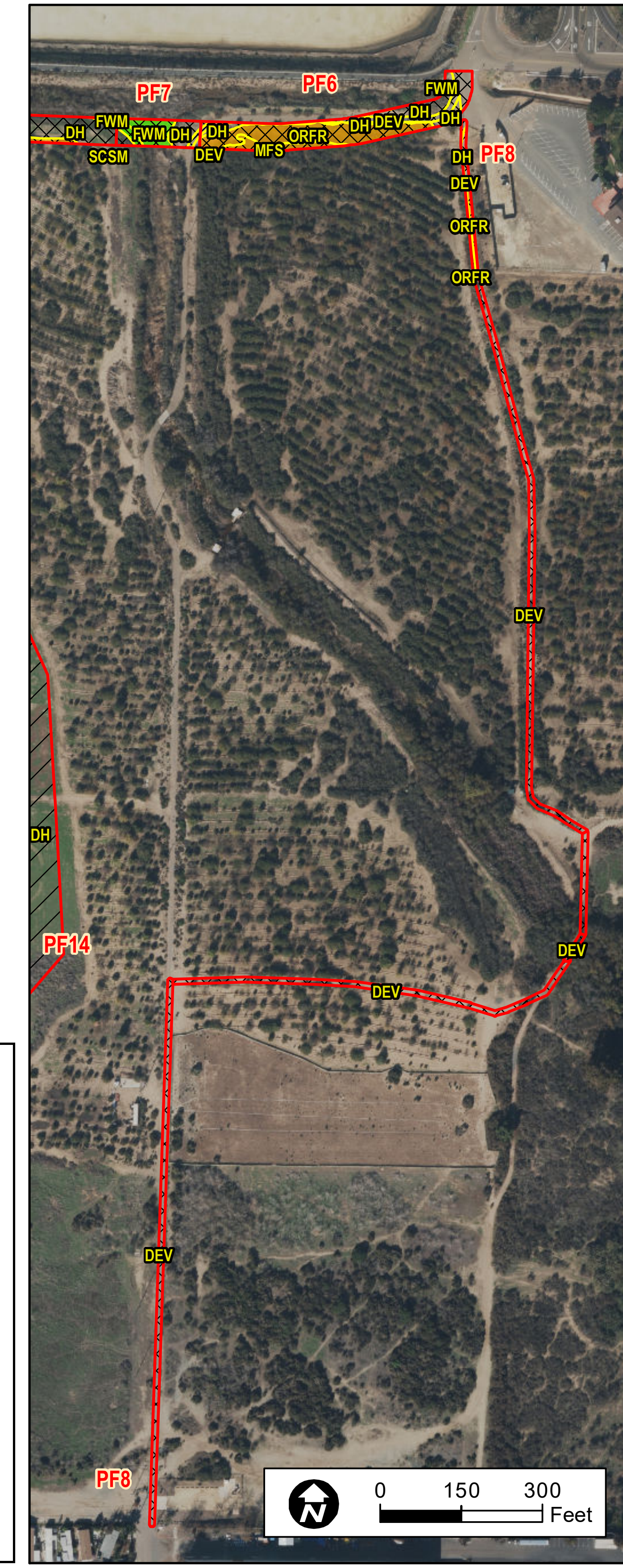
As summarized above for the project features, implementation of Alternative B would result in both temporary and permanent modifications to existing jurisdictional waters for restoring coastal wetlands. Although it is understood that all impacts to jurisdictional resources are considered permanent by the Corps and would be treated as such during permitting, most of the wetland impacts resulting from the project features would be restored upon completion of the proposed action. The temporary impacts to 2.52 ~~1.36~~ acres of wetlands within the project features would be restored to original conditions. These 2.52 ~~1.36~~ acres of impacts would be mitigated at a 1:1 ratio and would be restored in place to pre-project conditions (MM-BIO-1). The 1.33 ~~0.98~~ acres of jurisdictional wetlands that would be converted to uplands as part of the project features would be mitigated at a 4:1 ratio and would be included in the overall restoration (MM-BIO-3). The restoration of 115.83 ~~114.26~~ acres of coastal wetlands within the overall project site would more than offset the conversion of wetlands to uplands. The 0.65 ~~0.62~~-acre impact to Commission-only wetlands would be restored in place to pre-construction conditions (MM-BIO-1).

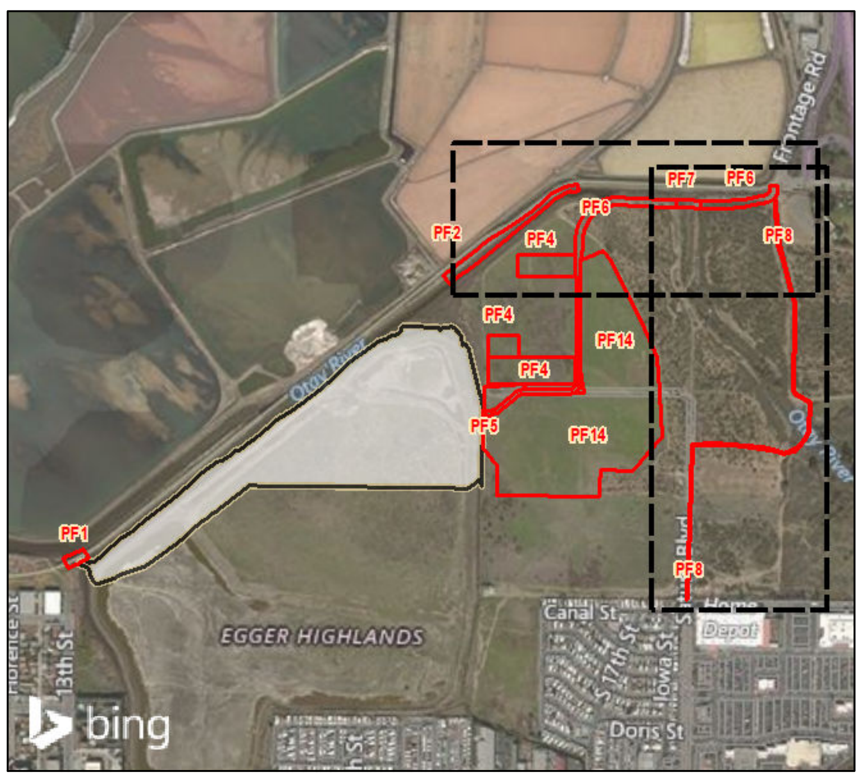
Table 4.3-9
Summary of Impacts to Jurisdictional Waters Resulting from Project Features for Alternative B

Vegetation Community/ Land Cover Type	Project Features under Corps, Regional Board, and Commission Jurisdiction, Except Where Noted as Commission-Only* (acres)													
	1	*2*	*~~3~~ 4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackishwater	0.13	0.09 ~~0.08~~						0.01						**0.22** **~~0.21~~**
Open water									0.40	0.79	0.08	0.03		**1.30**
Salt pond levee									0.33	0.19	0.08	0.31		**0.91**
Otay river floodplain restoration – Commission only					0.56		0.03							**0.59** **~~0.56~~**
Freshwater marsh						0.08								**0.08**
Mulefat scrub – Commission only					0.06									**0.06**
Southern coastal salt marsh	0.06	0.31 ~~0.47~~			0.02	0.02		0.06	0.19					**0.65** **~~0.82~~**
Disturbed habitat		0.68												**0.68**
Total**	**0.19**	**1.07** **~~0.55~~**	**—** **—**	**—**	**0.65**	**0.10**	**0.03** **—**	**0.07**	**0.92** **~~0.59~~**	**0.98** **~~0.79~~**	**0.16** **~~0.08~~**	**0.34** **~~0.03~~**	**—**	**4.51** **~~3.04~~**

* Commission wetlands define wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology).
** Totals may not sum precisely due to rounding.
1 Otay Channel Protection under Bikeway Bridge (temporary and permanent)
2 Otay Channel Protection (temporary and permanent)
~~3 Stockpiles (permanent)~~
4 Staging Area (temporary)
5 Crossing at Nestor Creek (temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (temporary)
7 Crossing at Otay River (temporary)
8 Bike Path Reroute (temporary)
9 Crossing at Palomar Channel (temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (temporary)
11 Levee Modification of Ponds 13 and 14 – North (temporary and permanent)
12 Levee Modification of Ponds 13 and 14 – South (temporary and permanent)
13 Raised Levee between Ponds 22 and 23 (permanent)
14 ~~Revegetation Area East of Nestor Creek~~Exposure Reduction Cover (permanent)







Otay River Floodplain Restoration Site
Project Feature (PF)
Permanent Impact
Temporary Impact

Waters of the U.S.

Wetlands, ACOE/RWQCB/CCC, Non-Section 10
Non-wetlands, ACOE/RWQCB/CCC, Non-Section 10
Non-wetlands, ACOE/RWQCB/CCC, Section 10 Tidal
Non-wetlands, CCC only

Vegetation Communities and Land Covers

ESTB, Brackishwater
FWM, Coastal and Valley Freshwater Marsh
MFS, Mule Fat Scrub
SCSM, Southern Coastal Salt Marsh
SPBB, Former Salt Pond Bottom and Borrow Area
IS, Isocoma Scrub
ORFR, Otay River Floodplain Restoration
DH, Disturbed Habitat
DEV, Developed Land
CAM, Cismontane Alkali Marsh

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-7

Project Features Jurisdictional Delineation Impacts associated with Otay River Floodplain Restoration Site

Otay River Estuary Restoration Project (ORERP)

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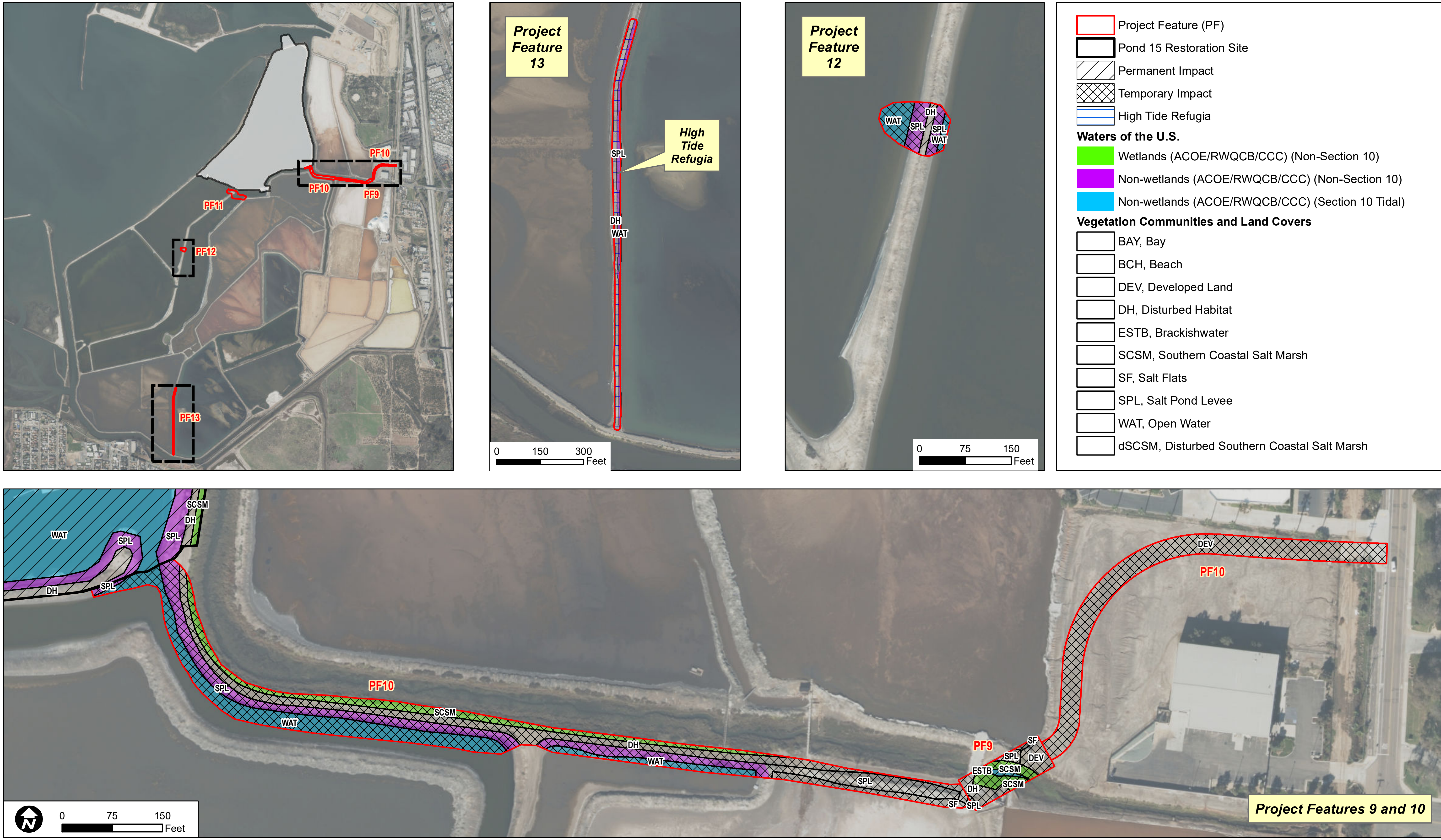

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FIGURE 4.3-8

Project Features Jurisdictional Impacts associated with Pond 15 Restoration Site

Otay River Estuary Restoration Project EIS

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Indirect Impacts

Otay River Floodplain Site

Implementation of Alternative B may result in a temporary and seasonal increase of fugitive dust that could disrupt plant vitality and decrease plant productivity. Construction activities, including dewatering, soil excavation, access/haul road resurfacing, clearing and grubbing, bike/pedestrian rerouting, soil transportation, and soil stockpiling, may result in increased levels of blowing dust that may settle on the vegetation surrounding construction areas. Construction dust emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and the prevailing weather conditions. Fugitive dust emissions could be generated by ground-disturbing activities and transport of material between the Otay River Floodplain Site and the Pond 15 Site. The proposed action is subject to San Diego County Air Pollution Control District (SDAPCD) Rule 55, Fugitive Dust Control. This rule requires that the proposed action take steps to restrict visible emissions of fugitive dust beyond the property line. Compliance with Rule 55 would limit fugitive dust (fine and coarse particulate matter (PM_{10} and $PM_{2.5}$)) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least twice daily in compliance with SDAPCD Rule 55.

~~Although the placement of excess material from excavation activities into two stockpiles adjacent to the Otay River Floodplain Site would not result in direct impacts to sensitive habitat or wetlands, the potential erosion from the stockpiles could impact the wetlands that are located near the stockpiles. As a result, MM-VIS-2 (Section 4.2.1, Topography/Visual Quality) has been incorporated into the proposed action to reduce impacts from the potential for runoff, sedimentation, and erosion of these stockpiles to below a level of significance. MM-VIS-2 includes the revegetation of the stockpiles based on a plan that would be prepared by a qualified restoration specialist, including an appropriate hydroseed mix, treatment, and monitoring.~~

Throughout construction, the contractor would be required to comply with National Pollutant Discharge Elimination System (NPDES) stormwater permit conditions, which would require that a stormwater pollution prevention plan (SWPPP) be prepared and implemented by the contractor. The SWPPP, which would remain in effect until all aspects of the proposed action are completed, would identify the best management practices (BMPs) to be implemented throughout construction to protect water and sensitive resources and to avoid temporary impacts. Indirect impacts to habitat and vegetation communities/jurisdictional waters at the Otay River Floodplain Site would be considered significant. MM-GEO-1 (see Section 4.2.2, Geology, Soils, and Agricultural Resources) includes preparation and implementation of a SWPPP. The measures described in MM-GEO-1 will address the BMP needs of the site for the duration of the construction, including periods when no construction activity is taking place (generally during the nesting season). With the implementation of MM-GEO-1, all indirect impacts to biological resources from runoff and erosion would be reduced to less than significant. ~~To ensure the long-term stability of soil stockpiles that would be placed adjacent to the Otay River Floodplain Site, erosion control measures described in MM-GEO-2 have been incorporated into the scope of the proposed action.~~ Implementation of MM-GEO-1 and MM-GEO-2 would reduce the potential for significant adverse impacts related to soil erosion and slope instability to below a level of significance. An analysis of the potential for increased erosion from water and wind as a result of implementation of Alternative B is addressed within the Hydrology and Water Quality section of this EIS (Section 4.2.5).

Sensitive wetlands are adjacent to the Otay River Floodplain Site. Runoff, fugitive dust, and human intrusion into these sensitive areas would potentially result in indirect impacts and degradation of the habitat, resulting in significant impacts. MM-GEO-1 and compliance with SDAPCD Rule 55 would provide mitigation and address fugitive dust and runoff. Potential intrusion by humans may cause impacts as a result of humans trampling vegetation and disturbing wildlife that live in the vegetation. Therefore, MM-BIO-4 is provided to inform construction workers of the presence of the sensitive habitat and help prevent accidental intrusion. MM-BIO-4 would require protective orange fencing and silt fencing around the sensitive habitat that is located ~~adjacent to the stockpiles,~~ in the wetlands in the Otay River, and surrounded by the staging area. The orange and silt fencing will be placed a distance from the sensitive habitat to provide a buffer of at least 25 feet. Following implementation of MM-BIO-4, impacts would be reduced to less than significant.

Accidental spills of fuel, lubricants, or coolants, if occurring in or adjacent to sensitive habitat, can create potentially toxic and harmful conditions for the habitat and wetlands. Spills that occur in sensitive habitat are potentially significant; therefore, MM-HYD-3~~2~~ is provided (see Section 4.2.5). MM-HYD-3~~2~~ would require that all construction equipment and vehicles be parked, and refueling and maintenance occur, only in designated areas. Following implementation of MM-HYD-3~~2~~, impacts would be reduced to less than significant.

Pond 15 Site

Implementation of Alternative B may result in indirect impacts from fugitive dust, erosion, runoff, human intrusion, trampling of vegetation, and toxic spills as a result of construction activities during restoration, similar to the discussion for the Otay River Floodplain Site. Indirect impacts would be addressed through compliance with SDAPCD Rule 55, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-2.

The proposed restoration activities at the Pond 15 Site may result in indirect temporary construction-related impacts to native vegetation and jurisdictional waters in the Palomar channel and the mudflats and salt marsh vegetation located along the edge of San Diego Bay to the north of Ponds 14 and 15 as a result of fugitive dust and sedimentation, in addition to significant impacts from runoff. The impact would be the same as that presented for the Otay River Floodplain Site, but the Pond 15 Site may also have increased sedimentation and dust issues due to trucks hauling dirt adjacent to sensitive habitat areas. Sedimentation adjacent to the Pond 15 Site is potentially significant; therefore, MM-BIO-4 is provided. MM-BIO-4 requires that trucks be covered, silt fencing be in place, and the area be monitored for indirect impacts. With implementation of the same mitigation measures required for the Otay River Floodplain Site, including MM-BIO-4, impacts would be less than significant.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. The analysis of this portion of the Pond 15 Site is the same as that provided above. Impacts and mitigation measures for the impact to the 1.30 acres of Port lands are the same as those for the Pond 15 Site.

Project Features

Similar to the indirect impacts described for the Otay River Floodplain Site, implementation of the project features under Alternative B could result in impacts from fugitive dust, erosion, runoff, human intrusion, trampling of vegetation, and toxic spills as a result of construction activities during restoration. Construction activities to establish the staging area, install berms, install temporary drainage crossings, modify levees, and establish a temporary bike route could result in increased levels of blowing dust that may settle on the vegetation surrounding construction areas. Construction dust emissions associated with the project features would vary depending on the level of activity, the specific type of operation, and the prevailing weather conditions. Fugitive dust emissions could be generated by ground-disturbing activities and transport of material between the Otay River Floodplain Site and the Pond 15 Site.

Implementation of project features associated with Alternative B could generate windblown dust that would settle on vegetation and jurisdictional resources surrounding the restoration construction areas at the Otay River Floodplain Site and Ponds 13, 14, 15, 28, and 29. Indirect impacts to habitat and vegetation communities resulting from dust and runoff would be significant.

The impact for the project features is the same as that presented for the Otay River Floodplain Site. As a result, the project features would have significant indirect impacts on habitat and vegetation communities and jurisdictional waters. Indirect impacts would be addressed through compliance with SDAPCD Rule 55, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-2. With the implementation of these measures, all indirect impacts to biological resources from fugitive dust and runoff would be reduced to less than significant.

~~Erosion and runoff also could occur from the exposed soils located in the stockpile areas (PF 3). Erosion leading to runoff and sedimentation in the sensitive habitat and wetlands adjacent to the stockpiles could result in indirect impacts on sensitive vegetation. MM-VIS-2 and MM-GEO-2 include the planting of stockpiled soils to prevent windblown dust impacts on vegetation and runoff from the stockpile impacting adjacent wetland habitat.~~

Mitigation Measures

Changes to the habitats in south San Diego Bay (South Bay) began in 1871 with the construction of the La Punta Salt Works, a small-scale solar salt evaporation facility. Between 1911 and 1916, the area used for solar salt production was expanded to include the entire end of the South Bay. In 1933, the land now occupied by Ponds 11, 12, 14, and 15 was acquired for incorporation into the La Punta Salt Works. By 1942, Ponds 12, 14, and 15 had been constructed, followed later by the construction of Pond 11. Based on the existing elevations of these ponds, it appears that in creating the salt ponds, significant portions of the intertidal mudflat and salt marsh habitat at the south end of San Diego Bay were eliminated (USFWS 2006).

The native upland and wetland habitat of the Otay River floodplain was all but eliminated during the 20th century as a result of industrial, agricultural, and municipal activities. Maps dating back as far as 1916 depict the Otay River in its present channelized configuration. A narrow corridor of salt marsh, freshwater marsh, and native riparian habitat are supported within the river channel, and remnant maritime succulent scrub habitat can still be found in the vicinity of the railroad right-of-way that extends between the south end of the South Bay Salt Works and the Otay River channel (USFWS 2006).

The loss of vegetation communities at the Otay River Floodplain Site, Pond 15 Site, and other project features would be offset by the restoration of approximately 115.83 ~~114.26~~ acres of tidally influenced habitat within this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in existing wetland areas and the reestablishment of the historical landscape in areas changed by human disturbance during the era of modern impacts associated with widespread urban development in the watershed. Currently, approximately half of the coastal wetlands in the Southern California Bight are either frequently closed or always closed to tidal influence, primarily as a result of human disturbance. Such closures reduce the availability of nutrients and dramatically alter salinities in the water column and in the soil. Many salt marsh plant species cannot tolerate these conditions, which over time have resulted in reduced native plant species diversity and lower habitat values (USFWS 2006). The salt ponds, including Pond 15, receive no benefit from tidal flushing. As a result, there are opportunities available in the San Diego Bay NWR for improving habitat values for wildlife, and for avian species in particular (USFWS 2006). Construction Methods (see

Section 4.3.2, Impacts to Endangered and Threatened Species and Other Species of Concern) would result in substantial restoration of habitat for tidal wetland species, a net increase in wetland area, and minimal impact to sensitive habitats or species.

The restoration areas would either abut or be surrounded by open space areas, and a substantial undeveloped buffer would surround the restoration sites to ensure that wetland habitat and sensitive species would remain undisturbed. Restoration of the Otay River Floodplain Site and Pond 15 Site would result in the return of tidal action to areas that have been isolated from San Diego Bay for more than 80 years. Historic maps indicate that the area proposed for restoration is former intertidal mudflat and salt marsh that has been filled for agriculture and salt production. Thus, the potential for successful restoration is high. The restoration plans call for establishment through excavation, placement of fill materials, and grading of a mixture of subtidal, intertidal, and mudflat wetland areas that would support a full array of estuarine and intertidal organisms. The conversion of the former and existing evaporation ponds to intertidal salt marsh, mudflats, and subtidal habitat would provide substantial fish habitat where none exists today. The role of unvegetated tidal creeks and sloughs as breeding areas and nurseries for estuarine-dependent fish has been well studied. The transient use of the intertidal salt marsh by species such as California killifish (*Fundulus parvipinnis*) has likewise been demonstrated. These values would all be enhanced by the proposed action. Furthermore, the intertidal mudflats created by the proposed action would provide breeding habitat for the goby species (Gobiidae) that are prevalent in Agua Hedionda Lagoon, which is the location of the affected habitat resulting from the Carlsbad Desalination Plant. To offset the potential impingement and entrainment impacts from the Carlsbad Desalination Plant, the MLMP requires creation, enhancement, or restoration of aquatic and wetland habitat, and ensures long-term performance, monitoring, and protection. Providing breeding habitat for goby species is one such measure of providing habitat similar to that affected by the Carlsbad Desalination Plant. The preferred restoration plan would provide a diverse assemblage of wetland habitats, including cordgrass (*Spartina* spp.)-dominated salt marsh, the preferred nesting and foraging habitat of light-footed Ridgway's rail~~ (*Rallus obsoletus levipes*)~~, and fishery resources that support California least tern (*Sternula antillarum browni*). It would also provide shallow subtidal habitat for nursery grounds for California halibut (*Paralichthys californicus*)**.**

<u>Restoration would also include transitional areas and areas of high tide refugia that will support native high salt marsh vegetation species. These plant species will continue to provide cover for the endangered light-footed Ridgway's rail until the extreme high tides recede. These plants will also provide potential nesting habitat for rails and the State endangered Belding's Savannah sparrow.</u>

MM-BIO-1 To avoid or minimize the permanent loss of native habitat or plant communities resulting from project features, any areas that are bridged, reinforced, or widened to accommodate construction equipment would be restored to pre-construction conditions and vegetated with appropriate native plant species once construction is complete per the Construction Methods as described in Section 2.3.2.4 of this Environmental Impact Statement. This includes the 2.52 ~~1.36~~ acres of jurisdictional impacts. To avoid or minimize any long-term impacts to habitat or vegetation, staging areas, access routes, and other disturbed areas shall be decompacted and recontoured to ensure proper site drainage, and revegetated with appropriate native species. Any temporary equipment, structures, or utilities (e.g., water, power) installed at the project site shall be removed at the completion of construction. Impacts from project features that cannot be restored to pre-construction conditions due to the requirements of the construction will be mitigated per the restoration outlined in the FRP. In addition, the temporary impacts (0.65 ~~0.62~~ acre) to the California Coastal Commission-only wetlands (mule fat scrub and Otay River Floodplain Restoration Site) shall be replaced in kind immediately upon completion of construction.

MM-BIO-2 Mitigation for conversion of wetlands from one type to another resulting from implementation of Alternative B (or Alternative C) shall be provided at mitigation ratios of 1:1 and 4:1. ~~in accordance with the Final Restoration Plan (FRP; Appendix C) at a 1:1 ratio. Mitigation is provided at a 1:1 ratio for the impact to 5.77 acres in the Otay River Floodplain Site and 84.37 acres at the Pond 15 Site. Mitigation shall provide 90.14 acres of tidally influenced wetlands. The combined total for the mitigation is 114.26 acres.~~

MM-BIO-3 Mitigation for permanent impacts to wetlands resulting from implementation of Alternative B (or Alternative C) shall be provided at mitigation ratios of 1:1 and 4:1. Mitigation for permanent impacts to wetlands for high tide refugia resulting from implementation of Alternative B shall be provided at a 2:1 ratio. Mitigation for the raising of the levee at Pond 22/23 shall be provided at a 4:1 ratio.

~~Mitigation for permanent impacts to wetlands resulting from implementation of Alternative B shall be provided in accordance with the FRP (Appendix C) at a 4:1 ratio. Mitigation is provided at a 4:1 ratio for the loss of 0.66 acres in the Otay River Floodplain Site, 3.77 acres at the Pond 15 Site, and 0.98 acre associated with the project features permanent jurisdictional impacts. Mitigation shall provide 21.64 acres of tidally influenced wetlands. The combined total for the mitigation is 114.26 acres.~~

MM-BIO-4 Prior to construction, the boundaries of the project site, including staging areas, ~~stockpiles,~~ and truck haul routes, shall be flagged and protective fencing/silt fencing shall be installed to the satisfaction of the San Diego Bay National Wildlife Refuge (NWR) Manager or designated project biologist as approved by the U.S. Fish and Wildlife Service (Service). Silt fencing shall also be installed around all existing cismontane alkali marsh to protect it from sedimentation, excessive runoff, and human intrusion. Construction plans shall include notes or mapping of the location of the protective fencing. In addition, a biological monitor shall be present during the pre-construction meeting and during initial grading of these areas to ensure that no construction activity occurs outside the designated construction boundaries. The biological monitor shall be on site during clearing, grubbing, and grading activities to ensure that the approved limits of disturbance are not exceeded. The biological monitor shall also conduct periodic monitoring of ~~stockpiles,~~ storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, all workers shall be educated by an approved biologist to recognize and avoid those areas that have been marked as sensitive.

In addition to the measures described under MM-HYD-3 and MM-HYD-4, the project biologist shall monitor conditions in sensitive habitat areas located adjacent to ongoing construction to ensure that no impacts related to sedimentation are occurring. If impacts are noted, additional measures shall be developed and implemented to minimize the effects of dust and sedimentation on sensitive resources.

4.3.1.3 Alternative C

Similar to Alternative B, habitat restoration activities under Alternative C would require the removal of the existing vegetation within a 33.51-acre area in the Otay River Floodplain Site, followed by excavation of this area to achieve elevations capable of supporting subtidal wetland habitat. Unlike Alternative B, the Otay River Floodplain Site would be recontoured to include a subtidal channel encompassing about 4.5 acres of the site. Also proposed are intertidal mudflats (including frequently flooded and frequently exposed zones), ~~and~~ intertidal coastal salt marsh (including low, mid, and high salt marsh zones), and transitional habitat. As discussed in Section 2.3, Alternatives Evaluated in Detail, ~~of this EIS,~~ in addition to the approximately 4.5 acres of subtidal, approximately 25.3 acres of coastal salt marsh habitat, mudflat and transitional (about 4.5 acres less than that provided under Alternative B) and approximately 3.7 acres of upland habitat would be created at the Otay River Floodplain Site (Table 4.3-10). The excavated material would be used as fill material at the Pond 15 Site to increase the bottom elevation of the pond and allow for more acreage of emergent vegetated coastal salt marsh to be restored there than would be possible without the addition of fill soils. The Pond 15 Site would also be recontoured to create similar but deeper tidally influenced subtidal and coastal salt marsh zones. ~~As discussed in Section 2.3 of this EIS, approximately 4.5 acres of subtidal habitat, approximately 25 acres of intertidal coastal salt marsh habitat, and mudflat (about 4.7 acres less than that provided under Alternative B), and 4.1 acres of upland habitat would be created at the Otay River Floodplain Site.~~

Approximately 9.8 ~~10~~ acres of subtidal habitat~~,~~; 75.0 ~~73~~ acres (approximately 0.7 ~~1.5~~ acres less than that provided under Alternative B) of coastal salt marsh habitat, ~~and~~ mudflat, and transitional habitat; and approximately 4.0 acres of upland habitat and 2.15 acres of high tide refugia (occurring from an elevation of over +7.8 feet NAVD88) would be created at the Pond 15 Site.~~7.8 acres (as compared to 6.26 acres under Alternative B) of upland habitat would be created at the Pond 15 Site.~~ Under Alternative C, the Pond 15 Site would support about 11.9 ~~12~~ acres of low salt marsh, ~~28~~ 33.3 acres of mid salt marsh, and ~~14~~ 12.6 acres of high salt marsh vegetation, as compared to 15.6 acres of low salt marsh, 34.9 ~~35~~ acres of mid salt marsh, and ~~5~~ 6.2 acres of high salt marsh vegetation under Alternative B.

A mix of native wetland species would be planted at both sites to create low, mid, and high coastal salt marsh vegetation communities. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 is provided in Table 4.3-10. Tidal hydraulics were analyzed to review the pre-action versus post-action change in Nestor Creek and the Otay River (Appendix G2). The tidal hydraulics modeling results were reevaluated to consider potential proposed action impacts on areas outside the project site, specifically Nestor Creek and the upper reach of the Otay River intertidal zone upriver from the Bayshore Bikeway Bridge**.** Based on comparisons of hydroperiod functions pre- and post-action, it was concluded that Alternative C would have a negligible effect on tidal inundation in the upper reach of the Otay River and would result in a slight reduction of tidal muting and an improvement in high water tidal inundation of Nestor Creek.

Based on the requirements of the MLMP (Poseidon 2008), the total densities and numbers of species of fish, macroinvertebrates, and birds is required to be similar to those within similar habitat at a reference location within 4 years of construction. Thus, although the restored habitat may not be fully mature and occupied by wildlife in the first couple of years, it is anticipated to meet the requirements within the first few years after planting.

Table 4.3-10
Proposed Restoration Vegetation Communities for Alternative C – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	4.48	9.81 ~~10.23~~
Mudflat – frequently flooded	4.75 ~~4.43~~	14.90 ~~16.11~~
Mudflat – frequently exposed	1.78 ~~2.00~~	1.36 ~~2.16~~
Low salt marsh	8.28 ~~8.34~~	11.92 ~~12.11~~
Mid salt marsh	6.17 ~~6.21~~	33.34 ~~28.06~~
High salt marsh	3.95 ~~3.94~~	12.56 ~~14.39~~
Transitional	0.35	0.89
*Total Created Wetland Habitat**	*29.77* ~~*29.41*~~	*84.79* ~~*83.06*~~
High Tide Refugia	—	2.15

Table 4.3-10
Proposed Restoration Vegetation Communities for Alternative C – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Upland habitat	3.74 ~~4.10~~	3.96 ~~7.85~~
Total *	**33.51**	**90.90**

~~**Source:** Appendix CJ.~~
* Acreage may not total due to rounding.

This restoration planning effort also factors in the potential for a 4.68- to 24-inch sea-level rise by 2050 (State of California 2013). For the purpose of complete disclosure, a summary of the habitat configuration and vegetation communities that would be expected based on anticipated 24-inch sea-level rise in 2050 is provided in Table 4.3-11. Regardless of sea-level rise, there would be no decrease in the total acreage of the restored wetlands at either site. The proposed restoration is illustrated in Figures 2-7a through 2-7d.

Table 4.3-11
Proposed Restoration Vegetation Communities for Alternative C – 2050

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	7.29 ~~4.48~~	16.06 ~~4.40~~
Mudflat – frequently flooded	12.87 ~~15.04~~	22.73 ~~24.95~~
Mudflat – frequently exposed	1.28 ~~1.48~~	2.94 ~~2.76~~
Low salt marsh	5.61 ~~6.96~~	29.61 ~~25.78~~
Mid salt marsh	2.77 ~~1.99~~	14.70 ~~17.31~~
High salt marsh	0.28 ~~0.36~~	2.96 ~~3.08~~
Transitional	0.18	1.91
*Total Created Wetland Habitat**	*30.28* ~~*30.31*~~	*90.90* ~~*88. 28*~~
Upland habitat	3.22 ~~3.20~~	~~2.63~~ —
Total*	**33.51**	**90.90**

~~**Source:** Appendix J.~~
* Acreage may not total due to rounding.

Direct Impacts

Habitat and Vegetation Communities

Otay River Floodplain Site

The analysis of impacts on habitat and vegetation communities and jurisdictional waters is the same as discussed for Alternative B. Alternative C would result in the direct conversion of 29.77 ~~29.41~~ acres of existing upland habitat and disturbed non-native and native vegetation within the Otay River Floodplain Site to wetland communities. Included would be the conversion of 12.33 ~~12.23~~ acres of native vegetation (i.e., *Isocoma* scrub and southern coastal salt marsh) to wetlands. Table 4.3-12 provides a summary of the impacts to existing vegetation communities and land cover types at the Otay River Floodplain Site (Figure 4.3-1). The entire 33.51-acre Otay River Floodplain Site would be permanently impacted for the conversion to native habitats, predominantly wetlands.

Although implementation of Alternative C would result in the conversion of existing habitat on the site, the impacted area would ultimately support subtidal wetland vegetation and native wetland and upland habitat, restoring historical wetland habitat values to the site. The restoration would include approximately 18.4 ~~18~~ acres of salt marsh creation with the balance of the wetlands composed of mudflat or transitional habitat.

Restoration conducted in the Otay River Floodplain Site would be limited to the portion of the floodplain located west of Nestor Creek, as described for Alternative B.

Similar to Alternative B, objectives of the restoration for Alternative C would contribute to the overall value of the wetlands, as summarized in the FRP (Appendix C of the draft EIS). The objectives are summarized under Alternative B.

Table 4.3-12
Summary of Impacts to Vegetation Communities and Land Cover Types at the Otay River Floodplain Site for Alternative C

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to Wetlands (acres)	Total Impact Areas (acres)
Brackishwater	—	0.77	0.77
Disturbed habitat	1.65 ~~1.83~~	7.03 ~~6.85~~	8.68
Former salt pond bottom and borrow area	1.19 ~~1.27~~	9.64 ~~9.56~~	10.83
Isocoma scrub	0.89 ~~1.00~~	11.08 ~~10.97~~	11.97
Southern coastal salt marsh	0.01	1.25 ~~1.26~~	1.26
Total	**3.74** ~~**4.10**~~	**29.77** ~~**29.41**~~	**33.51**

Source: Appendix J.

The wildlife foraging functions of the upland and disturbed vegetation communities would continue to be provided in the areas designated for upper salt marsh habitat and upland habitat. The impacts of conversion of the existing habitat values on the site would be beneficial, providing restoration of coastal wetland habitat to the Otay River Floodplain Site. As a result, the conversion of the *Isocoma* scrub uplands to tidal wetlands is considered adverse but less than significant in terms of upland habitat loss, and would be beneficial overall in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (1.26 acres) would be temporarily impacted, the restoration would result in a substantial increase in tidal and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 29.77 ~~29.41~~ acres of wetlands. Therefore, there would be a significant beneficial impact due to restoration of the Otay River Floodplain Site.

Pond 15 Site

Implementation of Alternative C would involve converting open water habitat within an existing solar salt pond to a subtidal channel, intertidal mudflats (including frequently flooded and frequently exposed zones), and intertidal salt marsh mudflat (including low, mid, and high salt marsh zones) by recontouring the Pond 15 Site. Similar to Alternative B, a total of 1.30 acres of land under the jurisdiction of the Port would be impacted.

Similar to the Otay River Floodplain Site and as discussed under Alternative B, very limited native habitat or vegetation communities are present on the Pond 15 Site, which currently includes open water habitat associated with a solar salt evaporation pond. Small patches of southern coastal salt marsh and disturbed southern coastal salt marsh compose only 1% (0.97 ~~0.94~~ acres) of the site.

Impacts to the Pond 15 Site as a result of implementation of Alternative C would be similar to the impacts discussed under Alternative B. The proposed restoration activities at the Pond 15 Site would result in direct impacts to 90.90 acres in the Pond 15 Site (Table 4.3-13; Figure 4.3-2). As a result of the proposed grading, the site would ultimately support native coastal wetland habitat (i.e., subtidal and intertidal wetlands) and native vegetation (i.e., coastal salt marsh). Table 4.3-13 provides a summary of the impacts to existing vegetation communities and land cover types at the Pond 15 Site.

Table 4.3-13
Summary of Impacts to Vegetation Communities and Land Cover Types at the Pond 15 Site for Alternative C

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to High Tide Refugia (acres)	Impact for Restoration to Wetlands – San Diego Bay NWR (acres)	Impact for Restoration to Wetlands – Port Lands (acres)	Total Impact Area (acres)
Bay	—	—	—	1.15	1.15
Beach	0.01	—	0.01	—	0.01
Disturbed habitat	1.58 ~~2.48~~	—	1.19 ~~0.29~~	—	2.77
Open water	0.38 ~~3.16~~	2.15	79.81 ~~79.17~~	—	82.33
Salt pond levee	1.50 ~~1.65~~	—	2.17 ~~2.02~~	—	3.67
Southern coastal salt marsh	0.48 ~~0.52~~	—	0.23 ~~0.20~~	0.16 ~~0.15~~	0.87

Table 4.3-13
Summary of Impacts to Vegetation Communities and Land Cover Types at the Pond 15 Site for Alternative C

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to High Tide Refugia (acres)	Impact for Restoration to Wetlands – San Diego Bay NWR (acres)	Impact for Restoration to Wetlands – Port Lands (acres)	Total Impact Area (acres)
Southern coastal salt marsh – disturbed	0.02 ~~0.04~~	—	0.08 ~~0.06~~	—	0.10
Total	**3.96 ~~7.85~~**	**2.15**	**83.49 ~~81.75~~**	**1.30**	**90.90**

Implementation of Alternative C would result in the modification of existing habitat and native vegetation communities for restoring the historical tidal wetland habitat value in this area to support native plant, fish, and wildlife species. Adequate acreage of native habitats would be restored (84.79 ~~83.05~~ acres of wetlands total) within the Pond 15 Site to offset the loss of open water and southern coastal salt marsh habitat.

Similar to Alternative B, objectives of the restoration in accordance with Alternative C would contribute to the overall value of the wetlands, as summarized in the FRP ~~(Appendix C)~~. The objectives are summarized under Alternative B.

As summarized in the FRP and described for Alternative B, the impacts of conversion of the existing habitat values on the site would be beneficial by providing restoration of coastal wetland habitat to the Pond 15 Site. As a result, the conversion of open water to tidal wetlands is considered adverse but less than significant in terms of habitat loss, and would be beneficial overall in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (0.97 acres) would be temporarily impacted, restoration would result in a substantial increase in salt marsh and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 84.79 ~~83.05~~ acres of wetlands. Therefore, there would be a significant beneficial impact due to the restoration of the Pond 15 Site.

San Diego Unified Port District Lands

Similar to Pond 15 under Alternative B, a total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. The acreage is presented in Table 4.3-13 and the impact is the same as the analysis provided under Alternative B.

Project Features

The potential direct impacts to habitat and vegetation communities from the project features due to implementation of Alternative C would be the same as those described for Alternative B (Figures 4.3-1 through 4.3-4). The 0.65 ~~0.62~~ acre impact to Commission-only wetland vegetation would be restored in place to pre-construction conditions (MM-BIO-1).

Jurisdictional Waters

Otay River Floodplain Site

Restoration activities at the Otay River Floodplain Site, as proposed under Alternative C, would result in direct impacts to jurisdictional waters. Approximately 6.43 acres of Corps, Regional Board, and Commission jurisdictional wetlands are present within the 33.51-acre Otay River Floodplain Site (Table 4.3-14). All of these wetlands would be impacted during grading.

Restoration would result in 29.77 ~~29.41~~ acres of jurisdictional wetlands (subtidal; mudflat;~~,~~ low, mid, and high salt marsh; and transitional), including 23.93 ~~23.61~~ acres of wetlands created within current upland areas and 5.84 ~~5.80~~ acres of high-quality wetland habitat created by recontouring and regrading existing wetlands. This gain in wetland acreage, combined with the expected increased productivity due to increased functions and services that a restored tidal system would provide, represents a beneficial impact. Table 4.3-14 provides a summary of the impacts to jurisdictional wetlands and waters at the Otay River Floodplain Site.

As discussed under Alternative B, a CRAM Report was prepared by Dudek in 2016 (Appendix E of Appendix J). The results of the CRAM analysis confirm that there would be a substantial improvement in the functions and services of wetlands and waters due to implementation of the proposed action for Alternative C.

Table 4.3-14
Summary of Impacts to Jurisdictional Waters
at the Otay River Floodplain Site for Alternative C

Vegetation Community	Corps, Regional Board, Commission Jurisdiction		
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to Wetlands (acres)*	*Total Impact Area (acres)*
Non-Wetland Waters ~~Wetlands~~			
Brackishwater	—	0.77	0.77
Former salt pond bottom and borrow area	0.3 ~~0.58~~	2.99 ~~2.94~~	3.52
Wetlands			
Southern coastal salt marsh	0.01	1.25 ~~1.26~~	1.26
Former salt pond bottom and borrow area	0.05	0.82	0.87
Total	**0.59 ~~0.63~~**	**5.84 ~~5.80~~**	**6.43**

Source: Appendix J.

Implementation of Alternative C would permanently impact 5.84 ~~5.80~~ acres of wetland that would be replaced as described above (Table 4.3-14; Figure 4.3-5). All of the 5.84 ~~5.80~~ acres of wetland would be converted to other wetlands under Alternative C and mitigated at a minimum of a 1:1 ratio in the Otay River Floodplain Site and Pond 15 Site (MM-BIO-2~~5~~). For the impact to 0.59 ~~0.63~~ acres of jurisdictional wetlands and waters of the United States (southern coastal salt marsh, former salt pond bottom, and borrow area) that would be converted to upland habitat, mitigation at a 4:1 ratio is required (MM-BIO-3~~6~~).

Pond 15 Site

The proposed restoration activities at the Pond 15 Site would result in direct permanent impacts to jurisdictional waters associated with the solar salt pond, similar to the impacts resulting from Alternative B.

Jurisdictional waters would be affected by filling within the salt pond and removing or otherwise manipulating the earthen salt pond levees. ~~Alternative C would result in a total of 82.77 acres of jurisdictional wetlands (mudflat, low, mid, and high salt marsh) by recontouring and regrading existing wetlands and waters. Alternative C would involve conversion of 88.14 acres of jurisdictional waters (non-wetland) to approximately 83.06 acres of jurisdictional wetlands.~~ Table 4.3-15 provides a summary of the impacts to jurisdictional waters at the Pond 15 Site, and is as described for Alternative B. The impacts to existing jurisdictional waters (non-wetlands), as indicated in Table 4.3-15 (Figure 4.3-6), would be offset by the creation of improved wetland vegetation of tidally influenced jurisdictional wetland waters within the Otay River Floodplain Site and Pond 15 Site.

This gain in wetland acreage, combined with the expected increased productivity of wetland functions that a restored tidal system would provide, represents a beneficial impact. A total of 83.13 ~~82.35~~ acres of non-wetland waters and 0.46 ~~0.41~~ acres of wetlands would be converted to 83.60 ~~82.77~~ acres of high-quality wetlands under Alternative C, and would be mitigated at the mitigation ratio described below as determined by the Corps. This mitigation would be implemented with the combined restoration at the Otay River Floodplain Site and Pond 15 Site. For the impact to the 2.38 ~~5.37~~ acres of salt pond levee, beach, open water, southern coastal salt marsh, and disturbed southern coastal salt marsh that would be converted to upland habitat, mitigation at a 4:1 ratio would be required. For the impact to the 2.15 acres of open water that would be converted to high tide refugia, mitigation at a 2:1 ratio would be required. The 83.60 ~~82.77~~ acres of predominantly non-wetland waters would be converted to subtidal, ~~intertidal,~~ mudflat, ~~and~~ coastal salt marsh, and transitional (Figures 2-7a through 2-7d). Table 4.3-15 provides a summary of the impacts to jurisdictional waters at the Pond 15 Site.

Table 4.3-15
Summary of Impacts to Jurisdictional Waters at the Pond 15 Site for Alternative C

Vegetation Community	Corps, Regional Board, Commission Jurisdiction				
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to High Tide Refugia (acres)*	*Impact for Restoration to Wetlands – San Diego Bay NWR (acres)*	*Impact for Restoration to Wetlands – Port Lands (acres)*	*Total Impact Area (acres)*
Bay	—	—	—	1.15	1.15
Beach	0.01	—	0.01	—	0.01
Open water	0.38 ~~3.16~~	2.15	79.81 ~~79.17~~	—	82.33
Salt pond levee	1.50 ~~1.65~~	—	2.17 ~~2.02~~	—	3.67
Southern coastal salt marsh	0.48 ~~0.52~~	—	0.23 ~~0.20~~	0.16 ~~0.15~~	0.87
Southern coastal salt marsh – disturbed	0.02 ~~0.04~~	—	0.08 ~~0.06~~	—	0.10
Total	**2.38 ~~5.37~~**	**2.15**	**82.30 ~~81.47~~**	**1.30**	**88.14**

The Pond 15 Site is an existing industrial solar salt production pond, but it does have some ecological function for migratory birds. As a result, the applicant undertook a “functional lift” assessment in consultation with the Science Advisory Panel appointed by the Commission. This analysis and conclusion is provided under Alternative B. In addition, a CRAM report was prepared and is also summarized under Alternative B. Dudek evaluated the Pond 15 Site from the perspective of the functions and services expected or anticipated after several years (e.g., 5 years) following construction to allow for the establishment of vegetation following the large-scale disturbances resulting from construction. Results of the analysis for the Pond 15 Site indicate that substantially improved functions and services of aquatic resources would result from the proposed action. Further, the ponds and associated islands and shorelines are anticipated to provide much greater biologic functions and services for the target wildlife species compared to the current condition or future condition absent the proposed action, as described in the FRP. The results of the CRAM analysis for the Pond 15 Site confirm that there would be a substantial improvement of the functions and services of wetlands and waters due to implementation of the proposed action.

San Diego Unified Port District Lands

Similar to Pond 15 under Alternative B, a total of 1.30 acres of Port lands that are jurisdictional resources are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. The acreage is presented in Table 4.3-15 and the impact is the same as shown in the analysis provided under Alternative B.

Jurisdictional Impacts Summary

With the total restoration, the Otay River Floodplain Site and Pond 15 Site would provide 89.44 ~~112.57~~ acres of jurisdictional wetlands, including native habitat and coastal salt marsh vegetation as well as mudflat and transitional habitat for foraging and ecotonal diversity. A mitigation ratio of 4:1 would be provided for the total jurisdictional impacts of 2.97 ~~6.01~~ acres for wetlands that are impacted and converted to upland habitat (0.59 ~~0.64~~ acres for the Otay River Floodplain Site and 2.38 ~~5.37~~ acres for the Pond 15 Site). A mitigation ratio of 2:1 would be provided for the total jurisdictional impacts of 2.15 acres for wetlands that are converted to high tide refugia at the Pond 15 Site. A mitigation ratio of 1:1 is provided for the jurisdictional impacts of 89.44 ~~88.57~~ acres of wetlands converted to tidal wetlands (5.84 ~~5.80~~ acres for the Otay River Floodplain Site and 83.60 ~~82.77~~ acres for the Pond 15 Site). Significant impacts to jurisdictional waters would result from implementation of Alternative C due to conversion of wetlands to upland habitat (4:1 mitigation; MM-BIO-3~~6~~) and the conversion of wetlands to native wetland communities (1:1 mitigation; MM-BIO-2~~5~~). Restoration of coastal wetland habitat would represent a direct beneficial impact on vegetation communities in the Pond 15 Site (Table 4.3-16).

Table 4.3-16
Determination of Mitigation Acreage Requirements for Impacts to Jurisdictional Resources from Alternative C

Site	Impact	Mitigation Ratio	Required Mitigation Acreage
Otay River Floodplain Site	5.84 ~~5.80~~ acres conversion of existing wetlands to tidal wetlands	1:1	5.84 ~~5.80~~
Otay River Floodplain Site	0.59 ~~0.64~~ acres conversion of existing wetlands to upland habitat	4:1	2.35 ~~2.56~~

Table 4.3-16
Determination of Mitigation Acreage Requirements for Impacts to Jurisdictional Resources from Alternative C

Site	Impact	Mitigation Ratio	Required Mitigation Acreage
Pond 15 Site	83.60 ~~82.77~~ acres conversion of existing wetlands to tidal wetlands	1:1	83.60 ~~82.77~~
Pond 15 Site	2.38 ~~5.37~~ acres conversion of existing wetlands to upland habitat	4:1	9.53 ~~21.48~~
Pond 15 Site	2.15 acres conversion of existing wetlands to high tide refugia	2:1	4.31
Project Features	2.52 ~~1.36~~ acres conversion of existing wetlands to tidal wetlands	1:1	2.52* ~~1.36*~~
Project Features	0.99 ~~0.98~~ acre conversion of existing wetlands to upland habitat	4:1	3.95 ~~3.92~~
Project Features	0.65 ~~0.62~~ acre of Commission-only wetland restored in place	1:1	0.65* ~~0.62*~~
Project Features	0.34 acre conversion of existing wetlands to upland (Pond 22/23 berm)	4:1	1.36
Total Required Mitigation Acreage			**110.94** ~~**116.53**~~
Mitigation Acreage Resulting from Restoration			**89.44** ~~**112.57**~~

*These acreages are not included in the total because the restoration will be at the location of impact immediately upon completion.

Project Features

The potential direct impacts to jurisdictional waters from the project features due to implementation of Alternative C would be the same as those described for Alternative B (Figures 4.3-5 through 4.3-8). The temporary impacts to 2.52 ~~1.36~~ acres of wetlands within the project features would be restored to original conditions. These 2.52 ~~1.36~~ acres of impacts would be mitigated at a 1:1 ratio and would be restored in place to pre-project conditions (MM-BIO-1). The 0.99 ~~0.98~~ acres of jurisdictional wetlands that would be converted to uplands as part of the project features would be mitigated at a 4:1 ratio and would be included in the overall restoration per the FRP (MM-BIO-~~6~~3). The 0.34 acres of the berm at Pond 22/23 would be impacted but then continue to function as nesting for shorebird and seabirds and would be mitigated at a 4:1 ~~2:1~~ ratio. The 0.65 ~~0.62~~-acre impact to Commission-only wetlands would be restored in place to pre-action conditions (MM-BIO-1).

As illustrated in Table 4.3-16, the total mitigation requirement, inclusive of the Otay River Floodplain Site, Pond 15 Site, and the permanent impacts resulting from the project features is 110.94 ~~116.49~~ acres. This is ~~greater~~ less than the anticipated restoration of 89.44 ~~112.57~~ acres by

21.50 ~~3.92~~ acres. Offsite purchase of mitigation credit at an approved wetland mitigation bank would provide for the shortfall of restoration acres per MM-BIO-7.

Indirect Impacts

Otay River Floodplain Site

Similar to Alternative B, implementation of Alternative C may result in potential indirect impacts. Mitigation measures are required and include compliance with SDAPCD Rule 55, MM-VIS-2, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-3~~2~~.

Pond 15 Site

The potential indirect impacts to habitat and vegetation communities and jurisdictional waters from implementation of Alternative C would be the same as those described for Alternative B. Indirect impacts would be addressed by compliance with SDAPCD Rule 55, MM-GEO-1, MM-GEO-2, MM-BIO-4, MM-HYD-1, and MM-HYD-2.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond as discussed for Alternative B. Indirect impacts and mitigation measures for the Port lands are the same as described for Alternative B.

Project Features

The potential indirect impacts to habitat and vegetation communities and jurisdictional waters from the project features due to implementation of Alternative C would be the same as those described for Alternative B. Indirect impacts would be addressed by compliance with SDAPCD Rule 55, MM-VIS-2, MM-GEO-1, MM-GEO-2, MM-HYD-~~2~~3, MM-HYD-4, and MM-BIO-4.

Mitigation Measures

The loss of vegetation communities at the Otay River Floodplain Site, Pond 15 Site, and project features would be offset by the restoration of approximately 115.83 ~~112.57~~ acres of tidally influenced habitat within this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity within existing wetland areas and reestablishment of the historical landscape in areas changed by human disturbance during the era of modern impacts associated with widespread urban development within the watershed.

~~**MM-BIO-5** Mitigation measures for conversion of wetlands from one type to another resulting from implementation of resulting from implementation of Alternative C shall be provided in accordance with the FRP (Appendix C) at a 1:1 ratio. Mitigation is provided at a 1:1 ratio for the impact to 5.80 acres in the Otay River Floodplain Site and 82.77 acres at the Pond 15 Site. Mitigation shall provide 88.57 acres of tidally influenced wetlands. The combined total for the mitigation is 112.57 acres.~~

~~**MM-BIO-6** Mitigation for permanent impacts to wetlands resulting from implementation of Alternative C shall be provided in accordance with the FRP (Appendix C) at a 4:1 ratio.~~ ~~Mitigation is provided at a 4:1 ratio for the loss of 0.64 acres in the Otay River Floodplain Site, 5.37 acres at the Pond 15 Site and 0.98 acre associated with the project features permanent jurisdictional impacts. Mitigation shall provide 27.96 acres of tidally influenced wetlands. The combined total for the mitigation is 112.57 acres.~~

MM-BIO-7 Permanent impacts to wetlands resulting from implementation of Alternative C would not be entirely offset by the wetland acreage provided as part of the FRP. ~~The total mitigation requirement based on the mitigation ratios and impacts is 116.53 acres. The acreage that is provided per the FRP is 112.57, resulting in a deficit of 3.96 acres.~~ This deficit shall be mitigated through the purchase of wetland mitigation credits at an agency-approved mitigation bank~~ for a total of 3.96 credits.~~.

Similar to Alternative B, with implementation of MM-BIO-1, MM-BIO-4, MM-GEO-1, MM-GEO-2, MM-HYD-~~2~~3, MM-HYD-4, and MM-VIS-2 and compliance with SDAPCD Rule 55, all direct and indirect impacts to biological resources would be reduced to less than significant. Additionally, MM-BIO-7 would mitigate for permanent impacts to wetlands that would result from implementation of Alternative C. Following implementation of mitigation measures, impacts would be less than significant.

4.3.2 Impacts to Endangered and Threatened Species and Other Species of Concern

The direct and indirect impacts to ~~Federally~~federally and State-listed endangered and threatened species, as well as any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (Service or USFWS), or by the California Native Plant Society, or any avian species identified as a Bird of Conservation Concern as a result of implementing the alternatives described herein are evaluated below. Cumulative impacts associated with endangered and threatened species and other species of concern are discussed in Section 4.6, Cumulative Impacts, of this EIS.

Significance Threshold: An impact to endangered and threatened species, as well as any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the Service, or by the California Native Plant Society, or any avian species identified as a Bird of Conservation Concern (USFWS 2008) would be considered significant if the action would substantially alter species presence, species reproductive success, species movement, or the availability of appropriate habitat to support such species.

The Otay River Floodplain Site offers low habitat value for wildlife species, primarily for migratory birds and common upland species, but also provides foraging habitat for a number of raptor species. The ~~Federally~~federally and State-listed endangered light-footed Ridgway's rail and the State-listed endangered Belding's Savannah sparrow ~~(*Passerculus sandwichensis beldingi*)~~ have both been observed on the Otay River Floodplain Site, and a number of other species of concern, as listed in Table 3.3-9, have also been observed on the site (see Figure 3.3-14 in Section 3.3). The federally and State-listed endangered California least tern, federally listed threatened western snowy plover (coastal population) (*Charadrius alexandrinus nivosus*), and the State endangered Belding's Savannah sparrow have been observed on the Pond 15 Site. Listed species and other species of concern that have potential to occur on the overall project site are addressed in Table 3.3-7 for plants and in Tables 3.3-9 and 3.3-11 for wildlife. Species that were determined to be absent or that have low or no potential are included in Tables 3.3-8 for plants and in Tables 3.3-10 and 3.3-12 for wildlife.

4.3.2.1 Alternative A

Direct Impacts

Otay River Floodplain Site

Under Alternative A, no restoration activities would occur on the Otay River Floodplain Site, Pond 15 Site, or the sites where project features would be implemented under the action alternatives. Existing habitats would not be altered and no disturbance from construction activities would occur.

No federally or State-listed plant species occur on the Otay River Floodplain Site. The western snowy plover, a federally threatened wildlife species, was observed nesting in the project vicinity in 2016 and 2017 (Patton pers. comm). Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a federally or

State-listed plant or wildlife species or other species of concern. Therefore, no direct impacts would occur as a result of Alternative A.

Pond 15 Site

No federally or State-listed plant or wildlife species occur on the Pond 15 Site, however, the federally threatened eastern Pacific green sea turtle has been observed in the bay waters to the north and west of Pond 15. Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a federally or State-listed plant or wildlife species or other species of concern. Therefore, no direct impacts would occur as a result of Alternative A.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the ~~Otay River Floodplain~~Pond 15 Site.

Project Features

Alternative A would not result in the implementation of project features; therefore, impacts would not occur on any federally or State-listed plant or wildlife species or other species of concern.

Indirect Impacts

Otay River Floodplain Site

~~No Federally or State-listed plant species occur on the Otay River Floodplain Site.~~ Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a federally or State-listed plant or wildlife species or other species of concern. Therefore, no indirect impacts would occur as a result of Alternative A.

Pond 15 Site

~~No Federally or State-listed plant species occur on the Pond 15 Site.~~ Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a federally or State-listed plant or wildlife species or other species of concern. Therefore, no indirect impacts would occur as a result of Alternative A.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the ~~Otay River Floodplain~~Pond 15 Site.

Project Features

Alternative A would not result in implementation of project features; therefore, impacts would not occur to any federally or State-listed plant or wildlife species or other species of concern.

Mitigation Measures

No significant direct or indirect impacts to listed species or other species of concern would occur under Alternative A; therefore, no mitigation is required.

4.3.2.2 Alternative B

Direct Impacts

Otay River Floodplain Site

Under Alternative B, existing habitats within the 33.51-acre Otay River Floodplain Site and the 90.90-acre Pond 15 Site would be converted to tidally influenced coastal wetland habitat, including high tide refugia, and associated upland ~~habitat and seabird nesting~~ habitat, as discussed in Section 2.3. Locations of special-status species are shown on Figures 3.3-11 through 3.3-16 in Section 3.3. Additional information is provided in Table 3.3-8.

Currently, available habitat for special-status wetland species is limited on the Otay River Floodplain Site. Small patches of wetland vegetation, including southern coastal salt marsh, remain on approximately 4% (1.26 acres) of the site. Additionally, none of the proposed intertidal or upland habitats are currently supported on the Otay River Floodplain Site. After the EIS was distributed for public review, western snowy plovers nests were observed in the vicinity of the site in 2016 and 2017 (at least three nests in each year were established). A burrowing owl (*Athene cunicularia*) successfully fledged three young from a nest located just to the south of the project site in 2017 (Patton, 2017).

The proposed restoration activities at the Otay River Floodplain Site would result in direct construction-related impacts to special-status plant species and their habitats (southern coastal salt marsh) (see Figure 3.3-11 in Section 3.3). Although no narrow endemic or federally or State-listed plant species were observed on the Otay River Floodplain Site, three plant species considered by the California Native Plant Society to be rare, threatened, or endangered in California were detected during focused botanical surveys in 2011: California box-thorn (*Lycium californicum*) (California Rare Plant Rank (CRPR) 4.2), estuary seablite (*Suaeda esteroa*) (CRPR 1B.2), and woolly seablite (*Suaeda taxifolia*) (CRPR 4.2) (Appendix C). Site preparation involving excavation and contour grading would result in the removal of 15 individuals of California box-thorn, 225 individuals of estuary seablite, and 8 individuals of woolly seablite, and approximately 1.26 acres of habitat (southern coastal salt marsh) that supports these species. Impacts due to removal of California box-thorn and woolly seablite would be less than significant due to the low status and low numbers affected with respect to the overall population within the region. Impact to estuary seablite due to the loss of individuals is considered a significant impact; therefore, MM-BIO-8 is provided. MM-BIO-8 requires that estuary seablite be included in the planting palette for the restoration site. With implementation of MM-BIO-8, impacts would be less than significant. In addition, the creation of high marsh and upland habitat would provide additional opportunities for the species to successfully reproduce and reestablish within the site.

The proposed restoration activities at the Otay River Floodplain Site would also result in direct impacts to potentially threatened or endangered wildlife species habitat. As noted above, western snowy plovers nests were observed in the vicinity in 2016 and 2017 however had not been recorded previously. Due to the marginal quality of the potential nesting habitat which floods frequently, the proposed restoration provides benefits by providing permanent foraging opportunities for western snowy plover as described below. Construction dewatering and grading would result in a temporary loss of approximately 1.26 acres of native southern coastal salt marsh habitat that is occupied by the State-listed threatened Belding's Savannah sparrow. In addition to Belding's Savannah sparrow, 10 special-status wildlife species were detected on site or adjacent to the site during the 2011 surveys: northern harrier (*Circus cyaneus*), Clark's marsh wren (*Cistothorus palustris clarkae*), merlin (*Falco columbarius*), white-tailed kite (*Elanus leucurus*), elegant tern (*Thalasseus* [=*Sterna*] *elegans*), gull-billed tern (*Gelochelidon nilotica*), light-footed Ridgway's rail, burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) (Appendix C). These species could be impacted by the loss of habitat in the Otay River Floodplain Site. However, creation of approximately 33.51 acres of native vegetation communities (i.e., low, mid, and high salt marsh and upland habitat) would provide suitable foraging and nesting habitat for threatened and endangered species on the Otay River Floodplain Site, including salt marsh habitat to support light-footed Ridgway's rail and Belding's Savannah sparrow; upland habitat to support foraging for San Diego black-tailed jackrabbit, short-eared owl, burrowing owl, merlin, and white-tailed kite; and mudflat areas to potentially support western snowy plover. The loss of upland habitat in this area is offset by the proposal to establish native upland vegetation to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality. This native upland vegetation would provide suitable habitat for the upland wildlife species.

The proposed restoration activities at the Otay River Floodplain Site could result in direct temporary construction-related impacts to nesting birds, potentially including threatened or endangered species such as light-footed Ridgway's rail and Belding's Savannah sparrow. Based on the presence of suitable nesting habitat, burrowing owl and northern harrier could nest on site. Nesting failure due to construction activities is a potential impact. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Avoidance of the breeding season would also result in avoidance of noise impacts on nesting special-status species. Nesting season avoidance Construction Methods include the following:

- Access to the site during construction would be controlled through the use of gates, fencing, and/or site security services. At the end of construction and during the nesting season, as determined by the San Diego Bay NWR biological staff, all equipment would be demobilized.
- Earthwork operations and any other construction activities would be limited to the non-breeding season, as determined by San Diego Bay NWR biological staff, to avoid disturbance during the nesting season. In addition, when the nesting period is confirmed to have ended, activity can commence and site-specific coordination would be undertaken with the Service to determine the details during construction. The Service would disclose dates to avoid for each species. At the end of the nesting dates, coordination with the Service would be undertaken to determine whether remaining species have completed nesting or whether they are nesting in locations that would not be potentially impacted by construction activities.

Burrowing owl, Belding's Savannah sparrow, and light-footed Ridgway's rail are present on the Otay River Floodplain Site all year. Construction on the site could potentially impact these species. Impacts to these species would be considered significant; therefore, MM-BIO-9 is provided. MM-BIO-9 requires pre-construction surveys in suitable habitat, hazing or moving species if found in proximity to the construction site, and monitoring during construction. With implementation of MM-BIO-9, impacts would be less than significant.

Restoration of the Otay River Floodplain Site to intertidal and upland transitional habitats would provide benefits to the San Diego Bay ecosystem and to the special-status species known to occur or with the potential to occur in wetland areas surrounding the South Bay.

Pond 15 Site

Restoration activities at the Pond 15 Site under Alternative B would result in the loss of 54 individuals of estuary seablite and approximately 0.97 acres of the southern coastal salt marsh habitat including disturbed southern coastal salt marsh that supports this species (see Figure 3.3-12 in Section 3.3). This loss of estuary seablite is considered significant. Similar to the Otay River Floodplain Site, mitigation is provided through MM-BIO-8, which requires that estuary seablite be included in the planting palette at a 2:1 ratio to account for the loss of this species.

In addition, the restoration of Pond 15 would result in the conversion of approximately 85 acres of an open water, highly saline pond to tidally influenced wetland habitats, including subtidal, mudflat, intertidal, and high tide refugia. Pond 15 is currently one of several ponds within the salt works complex that supports brine invertebrates that in turn support a range of waterbirds, as described in Section 3.3.

Today, the total acreage of salt ponds within the South Bay Salt Works is 783.5 acres of which approximately 390 acres constitute the existing salinity gradient within the system that produces brine invertebrates. The existing salinity gradients within the various ponds are presented in Table 4.3-17. The project would result in the conversion of 21.8% of the existing 390 acres of the solar salt ponds that currently support brine invertebrate production, primarily brine shrimp and brine flies.

Table 4.3-17
Existing Salinity Gradient; Pre-restoration Configuration of Salt Ponds

Pond Specific Gravity Ranges	Acreage	Present Salinity Gradient Function	Brine Invertebrate Production Ponds
Ponds 12 – 15 (3.5^0 – 10^0 Bé)	273.4	Primary Ponds	Yes
Ponds 20 -30 (10^0-25.5^0 Bé)	284.4	Secondary Ponds	Pond 20, 21, 22 Yes Pond 23 – 30 No
Ponds 40-47 (26^0 – 28.5^0) Bé	93.4	Crystallizer Ponds	No
Ponds 50 – 54 (29^0 – 30^0) Bé	27.0	Mag-chloride / Bittern Pond	No
	Grand Total	*Brine Invertebrate Production High Salinity Ponds*	*Hyper-saline Ponds (no brine invertebrate production)*
	783.5	**389.4**	**394.1**

* Degrees Baumé (Bé ^{0}) is a measure of relative density (specific gravity) of solutes in water and is used as a proxy for salinity measurements.

In response to the elimination of Pond 15 from the solar salt operation, current water management within the remaining solar salt works system will be altered to ensure proper evaporation rates and salinity levels throughout the system. The result will be a reduction in the amount of brine invertebrates present within the system and a change in the distribution of brine invertebrates within the remaining pond system. The same range of salinities will by necessity be retained within the system in order to continue the commercial production of solar evaporative salt. This in turn will continue the incidental production of high densities of brine invertebrates, although they may be located in different ponds once the salt works system is operating in its new configuration.

Following restoration, the tidally restored Pond 15 would no longer support large quantities of brine invertebrates; however, a number of the remaining solar salt ponds would continue to be available to support specific guilds of foraging birds, such as grebes and phalaropes. Therefore, these changes are not expected to result in significant adverse effects to the populations of those species that currently forage on brine invertebrates within the salt pond complex. Once restored to tidal influence, Pond 15 would ultimately provide foraging opportunities consistent with subtidal and intertidal habitats within San Diego Bay, supporting a variety of fish and invertebrate species, as well as subtidal vegetation (e.g., sea grasses, various species of algae).

Currently, the Pond 15 Site offers moderate habitat availability for sensitive, threatened, ~~sensitive,~~ and endangered species. Avian species forage for brine invertebrates in the pond and use the levees surrounding it for nesting. The federally endangered California least tern may occasionally forage on brine invertebrates, but forages primarily for fish, while federally threatened snowy plover has been observed foraging on brine invertebrates and nests adjacent to various salt ponds within the salt works. Neither species however has been observed nesting on available nesting features in and adjacent to Pond 15. The conversion of Pond 15 to tidal influence would not result in any significant adverse effects to these species, and would be expected to provide benefits to both in terms of expanded foraging opportunities.

~~The pond may be used for foraging and the levees surrounding it are used for nesting by the Federally endangered California least tern and Federally threatened western snowy plover. The State endangered Belding's Savannah sparrow uses the edges of the levees where salt marsh habitat is present for both foraging and breeding. The Federally threatened East Pacific green sea turtle (*Chelonia mydas*) is also known to occur in the portion of San Diego Bay located to the north of Ponds 14 and 15.~~

The State endangered Belding's Savannah sparrow uses the edges of the levees around Pond 15 where salt marsh habitat is present for both foraging and breeding. Seabirds known to nest on the levees or other nesting features within Pond 15 include the Caspian (*Hydroprogne caspia*), elegant, royal *(Thalasseus maxiumus)*, and Forster's terns *(Sterna forsteri)* and the black skimmer (*Rynchops niger*). Of these, the Caspian tern, elegant tern, and black skimmer are considered special-status species. Another special status species, the double-crested cormorant (*Phalacrocorax auritus*), has also be observed nesting around Pond 15, and the federally threatened East Pacific green turtle (*Chelonia mydas*) is known to occur in the portion of San Diego Bay located to the north and west of Pond 15. Gull-billed terns, which nest nearby, are also special-status species. Finally, the light-footed Ridgway's rail that has been observed in the Palomar Channel located adjacent to Pond 15.

Transitional areas and high tide refugia will support native high salt marsh vegetation species as described in Chapter 2 of this EIS and above in Section 4.3. The plant species that will be planted within the high tide refugia that remain emergent during extreme tides will continue to provide cover for the light-footed Ridgway's rail-. These plants will also provide potential nesting habitat for rails and Belding's Savannah sparrow. The high tide refugia will be an important habitat element of the restored wetland for these endangered species.

The proposed restoration activities at the Pond 15 Site would result in direct temporary construction-related impacts to threatened or endangered species, including Belding's Savannah sparrow, California least tern, and western snowy plover, as well as special-status species such as black skimmer~~ (*Rynchops niger*),~~, elegant tern, Caspian tern~~ (*Hydroprogne caspia*),~~, gull-billed terns, and double-crested cormorants~~ (*Phalacrocorax auritus*).~~. However, Construction Methods, as addressed in Section 2.3.2.4, including limiting construction activity to outside the breeding season (as determined by the San Diego Bay NWR biological staff) and adherence to MM-BIO-10, would ~~result in avoidance of~~minimize these impacts, particularly for species that are only present during the nesting season~~–~~. Implementation of MM-BIO-9, which requires pre-construction surveys and daily monitoring during construction, would avoid direct impacts to listed and special-status species, such as the light-footed Ridgway's rail, during construction.

The excavation activities associated with breaching the Pond 15 levee has the potential to impact East Pacific green sea turtles that may be present. No turbidity or sedimentation is expected, but during the breach, the hypersaline water of Pond 15 would mix with the water in San Diego Bay (Nordby, pers. comm. 2016). If East Pacific green sea turtles are present at the time of the breach, impacts may occur on this species. Impacts to East Pacific green sea turtle are considered significant; therefore, MM-BIO-11~~0~~ is provided. MM-BIO-11~~0~~, which has been incorporated into the scope of the project, requires that a qualified biologist monitor the area north of the outer salt pond levee prior to and during the levee breaching process to confirm that no turtles are present in the area. The monitor has the authority to stop work if a sea turtle is identified within the project vicinity. With implementation of MM-BIO-11~~0~~, impacts to sea turtles would be less than significant.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond. Impacts and mitigation measures for the Port lands are the same as described for Pond 15.

Project Features

Direct impacts from implementation of the project features could potentially result in impacts on species similar to those resulting from construction activities at the Otay River Floodplain Site and Pond 15 Site. It should be noted that the proposed impacts to Project Feature 13, raising the elevation of the levee between Pond 22 and Pond 23, would be constructed to provide suitable side slopes and appropriate substrate on the levee surface to support nesting western snowy plovers and other nesting birds. With implementation of MM-BIO-8, MM-BIO-9, ~~and~~ MM-BIO-10, and MM-BIO-11 impacts would be reduced to less than significant.

Indirect Impacts

Implementation of Alternative B would potentially result in significant indirect impacts to threatened, endangered, and other special-status species, including special-status plant species. Indirect impacts to breeding special-status species would occur if construction activities occur during the breeding season. These construction activities and human activity may disturb nesting and foraging breeding birds and potentially cause nesting failure.

Otay River Floodplain Site

Similar to the direct impacts, indirect impacts from construction could occur on species that are present in the project site all year. MM-BIO-9 would ~~help to avoid~~ minimize impacts to these species.

The proposed restoration activities at the Otay River Floodplain Site would result in indirect impacts to nesting birds, including special-status species such as light-footed Ridgway's rail and Belding's Savannah sparrow. Nesting failure due to construction activities is a potential impact. However, Construction Methods, as addressed in Section 2.3.2.4, would avoid and minimize impacts to these species. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

Through implementation of the Construction Methods, the potential for significant indirect impacts on nesting birds would be avoided.

In addition, per the Construction Methods described in Section 2.3.2.4, the contractor would be required to comply with NPDES stormwater permit conditions, as well as other local, State, and Federal permit/approval requirements. A SWPPP would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would identify and implement BMPs to protect water quality, air quality, and sensitive biological/wildlife resources, and to reduce construction-related noise. These potential impacts are addressed by MM-GEO-1 and would reduce potential indirect impacts to special-status species, including plants, to less than significant.

Pond 15 Site

Implementation of Alternative B may result in indirect impacts to threatened or endangered species if construction activities occur during the breeding season. Such activities may disturb nesting and foraging breeding birds and could cause nesting failure. Avoidance of the bird breeding season would result in avoidance of these significant impacts. The proposed restoration activities at the Pond 15 Site would result in indirect temporary construction-related impacts to nesting birds, including listed and special-status species such as California least tern, western snowy plover, and Belding's Savannah sparrow. Nesting failure due to construction activities is a potential impact. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond. Indirect impacts and mitigation measures for the Port lands are the same as described for Pond 15.

As a result, Alternative B, with implementation of the Construction Measures, would minimize indirect impacts to threatened, endangered, or other special-status species at the Pond 15 Site.

In addition, per the Construction Methods described in Section 2.3.2.4, the contractor would be required to comply with NPDES stormwater permit conditions, as well as other local, State, and Federal permit/approval requirements. A SWPPP would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would also implement BMPs to protect water quality, air quality, and sensitive biological/wildlife resources, and to reduce construction-related noise. These potential impacts are addressed by MM-GEO-1.

Project Features

Similar to the Otay River Floodplain Site and Pond 15 Site, limited habitat is available for threatened or endangered species within the project features. The potential indirect impacts to threatened, endangered, and other special-status species within the project features from implementation of Alternative B would be the same as for the Otay River Floodplain Site and Pond 15 Site.

Mitigation Measures

MM-BIO-8 To mitigate for the loss of estuary seablite (*Suaeda esteroa*), a sensitive plant species, from the Otay River Floodplain Site and the Pond 15 Site, estuary seablite shall be included in the planting palette. Estuary seablite planting shall be included in the mid-high marsh habitat and shall be planted at a 2:1 ~~(new:impacted)~~ mitigation ratio in newly created mid to high marsh areas, and *Lycium californicum* and *Suaeda taxifolia* shall be included in the planting palette for the new wetlands at a 1:1 ratio. A monitoring plan and success criteria for evaluating estuary seablite populations shall be included in the Revegetation Plan required by MM-VIS-1.

MM-BIO-9 **Special-status birds.** No earlier than 30 days prior to the commencement of clearing, grubbing, and earth movement on the project site, the NWR Manager and/or project biologist shall conduct focused pre-construction surveys for light-footed Ridgway's rail (*Rallus obsoletus levipes*) and other avian species (such as western snowy plover (*Charadrius alexandrinus nivosus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*~~)~~), and burrowing owl (*Athene cunicularia*)) in the vicinity of the project site. Daily surveys for the presence of rails (family Rallidae) and other sensitive bird species shall be conducted at the Otay River crossing, in the Palomar channel, and in other potential rail habitat areas in the vicinity of the project. If sensitive species are present, an air horn or cracker shells shall be deployed to move the birds off the site prior to commencement of construction activities. If noise proves ineffective, physical presence may be used to haze birds and move them to safer parts of the San Diego Bay NWR. Such monitoring shall continue throughout the day to discourage rails and other birds from moving back into the project site, particularly during periods when construction equipment is not operational, such as during breaks. A subsequent pre-construction survey shall be conducted prior to the commencement of construction activities in subsequent years and daily monitoring should be reinitiated until all construction activity ceases on the project site.

MM-BIO-10 To avoid impacts to nesting birds, all construction activity in and surrounding the Otay River Floodplain Site and the Pond 15 Site shall be confined to the period between September 30 and February 15, unless work outside this period is authorized by the Refuge Manager.

MM-BIO-11~~0~~ **East Pacific green sea turtle.** A qualified biologist shall be on site during preparation for and implementation of the breaching of the Pond 15 levee to visually monitor for the presence of East Pacific green sea turtle (*Chelonia mydas*) and other sensitive species. The biologist shall have the authority to halt construction when wildlife is observed within or near the project site. Should working vessels (e.g., dredge, barge) be used to breach the Pond 15 levee, travel in the area would adhere to a 5-mile-per-hour speed limit. ~~If pipelines are used, the pipe will be laid such that at least 3 feet of water is available for a turtle to pass through the area at low tide.~~ Land and/or water work crews shall be briefed on how to identify sea turtles and marine mammals that could occur in vicinity of the area affected by the breaching process. The biological monitor shall prepare incident reports of any observed sea turtle activity, and shall provide such reports to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries) within 24 hours of an observation. In the event of an incident involving a marine mammal or sea turtle, the Service shall immediately contact the NOAA Fisheries Southwest Regional Office's Stranding Coordinator, and shall submit a report to NOAA Fisheries within 24 hours.

The proposed action would create and enhance natural coastal wetlands that would support threatened, endangered, and other special-status species that occur or potentially occur on the project site and in the San Diego Bay NWR. The loss of fish and wildlife species habitat at the Otay River Floodplain Site, Pond 15 Site, and project features would be more than offset by the restoration of approximately 115.83 ~~114.26~~ acres of tidally influenced and transitional habitat in this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in existing wetland areas and the reestablishment of the historical landscape in areas changed by human disturbance more than 100 years ago.

4.3.2.3 Alternative C

Under Alternative C, similar to Alternative B, existing habitats within the 33.51-acre footprint on the Otay River Floodplain Site and the 90.90-acre footprint on the Pond 15 Site would be converted to tidally~~–~~-influenced coastal wetland habitat and associated upland transitional and seabird nesting habitat, as discussed in Section 2.3. Locations of special-status species are shown on Figures 3.3-11 through 3.3-16 in Section 3.3.

Direct and Indirect Impacts

Otay River Floodplain Site

The proposed restoration activities at the Otay River Floodplain Site would result in direct impacts to potentially threatened, endangered, and other special-status species habitat. Construction dewatering and grading would result in the temporary loss of approximately 1.26 acres of native salt marsh habitat. However, creation of approximately 33.51 acres of wetland and transitional habitat (including low, mid, and high marsh) would provide additional suitable foraging and nesting habitat for threatened or endangered species on the Otay River Floodplain Site. In addition to potential impacts to special-status species habitat, there is a potential for direct impacts to special-status species, as addressed under Alternative B.

The potential direct and indirect impacts to threatened, endangered, and other special-status species, including plants, on the Otay River Floodplain Site from implementation of Alternative C would be the same as those described for Alternative B.

Pond 15 Site

Currently, the Pond 15 Site offers moderate habitat availability for threatened and endangered species. The habitat value of the site is expected to increase significantly with implementation of the flooding and coastal salt marsh revegetation of the proposed action, which would provide extensive foraging and nesting habitat for threatened and endangered species.

The proposed restoration activities at the Otay River Floodplain Site would result in direct temporary construction-related impacts to nesting birds, including threatened or endangered species such as western snowy plover, California least tern, and Belding's Savannah sparrow. Nesting failure due to construction activities is a potential significant impact. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts.

The potential direct and indirect impacts to threatened, endangered, and other special-status species, including plants, on the Pond 15 Site from implementation of Alternative C would be the same as those described for Alternative B.

San Diego Unified Port District Lands

Potential direct and indirect impacts to threatened, endangered, and other special-status species for the Port lands are the same as those described for Alternative B.

Project Features

Similar to the Otay River Floodplain Site and Pond 15 Site, limited habitat is available for threatened or endangered species in the project features. The potential direct and indirect impacts to threatened, endangered, and other special-status species in the project features from implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

The proposed action would create and enhance natural coastal wetlands that would support threatened or endangered species that occur or potentially occur on the project site and in the San Diego Bay NWR. The loss of fish and wildlife species habitat at the Otay River Floodplain Site, Pond 15 Site, and project features would be more than offset by the restoration of approximately 89.44 ~~114.30~~ acres of tidally influenced and upland transitional habitat in this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in existing wetland areas and the reestablishment of the historical landscape in areas changed by human disturbance more than 100 years ago.

Similar to Alternative B, mitigation would be provided through MM-BIO-8, MM-BIO-9, ~~and~~ MM-BIO-10, and MM-BIO-11 for significant impacts to special-status plants and wildlife under Alternative C.

4.3.3 Impacts to Wildlife and Fisheries

Impacts to wildlife and fisheries as a result of implementing the proposed alternatives are described in detail in this section. Potential impacts on these resources are characterized by evaluating direct and indirect impacts. Cumulative impacts are addressed in Section 4.6.

Significance Threshold: An impact to wildlife and fisheries would be considered significant if the proposed action would substantially change the amount or quality of available habitat to support one or more fish or wildlife species, substantially interfere with the movement of any native resident or migratory wildlife species, and/or result in a substantial change in the local population of one or more fish or wildlife species.

4.3.3.1 Alternative A

Under Alternative A, no restoration or enhancement activities would occur on the Otay River Floodplain Site, Pond 15 Site, or project features. The disturbed areas in the Otay River Floodplain Site would not be restored to coastal wetlands. The Pond 15 Site would not be restored to tidally-~~–~~influenced subtidal or intertidal habitat. Additionally, the project features associated with the proposed restoration activities would not be implemented.

Direct Impacts

Otay River Floodplain Site

Implementation of Alternative A would not result in any change to the existing Otay River Floodplain Site. As such, no significant impacts to wildlife or fisheries would occur. Existing habitat quality would remain unchanged, no impacts to existing wildlife or fish populations would result, and no changes to current wildlife or fish movement would occur.

Pond 15 Site

Impacts from implementation of Alternative A for the Pond 15 Site would be the same as those for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not result in implementation of any of the project features; therefore, no direct impacts to wildlife or fisheries would occur. Existing habitat quality would remain unchanged, no impacts to existing wildlife or fish populations would result, and no changes to current wildlife or fish movement would occur.

Indirect Impacts

Otay River Floodplain Site

Implementation of Alternative A would not result in a substantial change to the amount or quality of available habitat to wildlife species. As a result, Alternative A would have no significant indirect impact on wildlife or fisheries at the Otay River Floodplain Site.

Pond 15 Site

Impacts from implementation of Alternative A for the Pond 15 Site would be the same as those for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not result in implementation of any of the project features; therefore, no indirect impacts to wildlife or fisheries would occur. Existing habitat quality would remain unchanged, no impacts to existing wildlife or fish populations would result, and no changes to current wildlife or fish movement are proposed.

Mitigation Measures

Since no significant direct or indirect impacts to wildlife or fisheries would occur at the Otay River Floodplain Site, Pond 15 Site, or the project features, no mitigation measures would be required under Alternative A.

4.3.3.2 Alternative B

Under Alternative B, the Otay River Floodplain Site would be converted ~~from upland habitat~~ to approximately 29.77 ~~29.61~~ acres of coastal wetland habitat~~,~~ and 3.74 ~~3.90~~ acres of upland habitat. ~~a~~At the Pond 15 Site, 90.90 acres would be converted from open water habitat that has no tidal influence or connection to the rest of San Diego Bay (part of the solar salt pond facility) to approximately 86.06 ~~84.65~~ acres of tidally influenced coastal wetland habitat, 3.88 ~~and 6.26~~ acres of upland habitat, and 0.96 acres of high tide refugia.

Wildlife

The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to the presence of globally significant populations of nesting gull-billed terns and continentally significant populations of surf scoter (*Melanitta perspicillata*), Caspian tern, and western snowy plover. The entire southern end of San Diego Bay has been recognized as a Western Hemisphere Shorebird Reserve Network Site.

Fisheries

The fisheries of south San Diego Bay are recognized as a valuable resource, and the intertidal salt marsh, intertidal mudflat, and subtidal habitat are regionally valuable habitats targeted for restoration/creation in the Southern California Bight (USFWS 2006). The extensive shallow-water habitat and eelgrass (*Zostera* spp.) beds of the south San Diego Bay provide important habitat for a variety of fish, including midwater schooling fish such as northern anchovy (*Engraulis mordax*), slough anchovy (*Anchoa delicatissima*), and topsmelt (*Atherinops affinis*). These species, in turn, represent a major forage resource for predatory fish and avian species. The south end of San Diego Bay also functions as an important nursery area for juvenile California halibut and young spotted bass (*Micropterus punctulatus*) and barred sand bass (*Paralabrax nebulifer*).

San Diego Bay has been designated as essential fish habitat for various species managed under the Pacific Coast Groundfish Plan and Coastal Pelagic Species Fishery Management Plan (as discussed in USFWS 2006). In addition, it contains both "estuary" and "seagrass" (i.e., eelgrass) habitat, which have been identified as habitat areas of particular concern for species in the Pacific Coast Groundfish Fishery Management Plan (as discussed in USFWS 2006). Habitat areas of particular concern are subsets of essential fish habitat that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Habitat areas of particular concern are used to focus conservation efforts.

Direct Impacts

Otay River Floodplain Site

Wildlife

Currently, available habitat for wintering waterfowl and migrant and wintering shorebirds is limited on the Otay River Floodplain Site. Small patches of disturbed wetland communities, including southern coastal salt marsh, remain on approximately 1.26 acres of the site, and

Isocoma scrub, an upland habitat, provides foraging and nesting areas for a variety of upland species. The species observed in this upland area are generally common species tolerant of or capable of taking advantage of areas dominated by shrub cover and non-native plant species.

The proposed restoration activities at the Otay River Floodplain Site would result in direct impacts to available habitat for wintering waterfowl, migrant and wintering shorebirds, and other waterbirds, and the permanent loss of upland habitat that supports a variety of birds, such as raptors and songbirds, and various species of mammals. During biological surveys in 2011, 79 species of birds were observed, including frequent observations of house finch (*Carpodacus mexicanus*) and lesser goldfinch (*Spinus tristis*), several swallow species foraging over the site, and coastal shorebirds and gulls observed flying over the site. Four mammal species were also observed in 2011 on the site.

A number of special-status wildlife species were detected on the Otay River Floodplain Site. These species are discussed in Section 4.3.2.

The proposed restoration activities at the Otay River Floodplain Site would represent a direct loss of 22.80 ~~18.40~~ acres of potential upland foraging and nesting habitat and 2.03 ~~6.43~~ acres of conversion of wetland foraging and nesting habitat. This loss would displace some existing species (e.g., upland bird species, reptiles, mammals), while expanding the available habitat for other species (e.g., migratory shorebirds and seabirds, waterbirds, fish, and benthic invertebrates). The loss of upland habitat in this area is offset by the proposal to establish native upland habitat to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality.

As a result, Alternative B would have no significant direct impact on the wildlife species currently supported in the Otay River Floodplain Site, and no mitigation is required.

Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of impacts to listed and special-status species as well as other wildlife. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant direct impacts to wildlife present on or adjacent to the Otay River Floodplain Site, and no mitigation is required.

Fisheries

The proposed restoration activities at the Otay River Floodplain Site could result in direct impacts to fish when the restored area is open to tidal action, During the period when the Otay River Floodplain Site is being breached, there is potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the opening of the site. The potential for direct impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-3~~1~~ and MM-HYD-4. No other significant direct impacts to fisheries are anticipated.

Pond 15 Site

Wildlife

Currently, the Pond 15 Site provides foraging, loafing, and rafting habitat for wintering waterfowl, migratory and wintering shorebirds, migratory seabirds, and other year-round waterbirds and summer visitors. Although the number of birds on the salt pond can be high, species richness is low, especially compared to the adjacent San Diego Bay where species richness is very high, as different species forage in response to the tidal cycles and the alternating of exposure and inundation of mudflats. Habitat in the project site consists of mostly open hypersaline water, with a narrow upland perimeter formed by the levee system.

Direct permanent impacts would result from the conversion of the Pond 15 Site from an enclosed water habitat to a tidally influenced habitat. This conversion is likely to result in a change in the numbers and diversity of birds using the pond, but would not result in the elimination of this habitat in the San Diego Bay NWR. A number of salt ponds would still be available to support species such as red-necked phalarope (*Phalaropus lobatus*), Wilson's phalarope (*P. tricolor*), black-necked stilt (*Himantopus mexicanus*), and American avocet (*Recurvirostra americana*) that frequent the primary salt ponds. During construction, the proposed action would result in the temporary loss of approximately 90.90 acres of foraging and nesting habitat in Pond 15 as the water is transferred into other ponds in the system and the pond is filled to achieve elevations that would ultimately support a range of subtidal and intertidal habitats. Other areas of the South Bay Salt Works would be available to support the migratory and resident bird species that use the Pond 15 Site for foraging, rafting, and loafing.

Implementation of Alternative B would temporarily eliminate the habitat value of the Pond 15 Site and permanently result in a conversion of habitat within the site by replacing open water habitat with tidally influenced habitat. The temporary impacts are not considered significant because there is adequate habitat available in the South Bay Salt Works to accommodate the birds currently using the Pond 15 Site, and all work would be performed outside the breeding season. In addition, although some species of birds would be permanently displaced, other ponds in the salt pond system would continue to provide foraging, loafing, and rafting opportunities to support these species. Once the Pond 15 Site is connected to the Bay and the area is subject to tidal influence, the habitat quality would increase and new foraging opportunities would develop over time, providing a net benefit to a wide range of bird species.

Similar to the Otay River Floodplain Site, restoration on the Pond 15 Site could result in direct impacts to nesting birds on and adjacent to the site. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant direct impacts to nesting birds in or adjacent to the Pond 15 Site, and no mitigation would be required.

Fisheries

Although San Diego Bay is identified as a habitat area of particular concern for estuaries and Pacific coast groundfish, the proposed restoration would provide more fish habitat once the levee on the Pond 15 Site has been breached. Therefore, no potential long-term direct impacts are expected.

The restored pond would also provide habitat to support fish and other marine organisms that are not currently supported in the Pond 15 Site. As a result, implementation of Alternative B would provide a net long-term benefit to fish at the Pond 15 Site.

During the period when the levee for Pond 15 is being breached, there is a potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the breaching of Pond 15 (Nordby, pers. comm. 2016). However, any potential for direct impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-1 and MM-HYD-2.

An eelgrass survey conducted in San Diego Bay in 2014 indicates that eelgrass occurs along the southern edge of the Chula Vista Wildlife Reserve, about 850 feet to the west of the proposed breach site in Pond 15 (NAVFAC and Port 2014; Figure 3.3-8). Because the location of eelgrass habitat in the Bay fluctuates naturally on a seasonal and annual basis, and the closure of the South Bay Power Plant has improved conditions for eelgrass in the vicinity of Pond 15, the eelgrass distribution in this area may have changed since 2014. Therefore, to ensure that any adverse impacts to eelgrass habitat are adequately addressed pre- and post-construction, eelgrass surveys would be conducted in the vicinity of the proposed breach site (MM-BIO-12~~1~~). Surveys will be conducted in accordance with the Southern California Eelgrass Mitigation Policy, which offers specific guidelines for appropriate responses and mitigation measures for activities that threaten eelgrass vegetated habitats.

San Diego Unified Port District Lands

Potential impacts to wildlife and fisheries for the Port lands are the same as described for the Pond 15 Site.

Project Features

Similar to the Otay River Floodplain Site, available habitat in the project features for wintering waterfowl and migrant and wintering shorebirds is limited. Most of the project features occur in disturbed habitat.

Similar to the Otay River Floodplain Site and per implementation of the Construction Methods outlined in Section 2.3.2.4, direct impacts to wildlife and fish from the project features would be less than significant.

Similar to the Otay River Floodplain Site, restoration on any of the 14 project features described in Chapter 2 could result in direct impacts to nesting birds on and adjacent to the various project features. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2. As stated previously, the changes to the levee between Pond 22 and 23 would not impact nesting shorebird or seabird nesting, as the raised levee will be designed to provide suitable slope gradients and appropriate substrate on the levee top to support shorebird and seabird nesting.

As a result, implementation of the project features associated with Alternative B would not result in any significant direct impacts to wildlife or fisheries, and no mitigation would be required.

Indirect Impacts

Otay River Floodplain Site

Wildlife

Temporary indirect impacts related to disturbance from construction noise and activity would affect wildlife use, including birds and terrestrial wildlife, in habitat areas adjacent to the Otay River Floodplain Site. This disturbance could occur Monday through Friday from 7 a.m. to 7~~6~~ p.m. from September to February for up to 3 years. ~~3 to 7 years.~~ Because noise associated with construction would only occur outside the breeding season, no impacts would occur. In addition, the loss of upland habitat in this area is offset by the proposal to establish native upland vegetation to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality.

Similar to the direct impacts for the Otay River Floodplain Site, indirect impacts to nesting birds could result from the proposed restoration activities at the Otay River Floodplain Site. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant indirect impacts to nesting birds in or adjacent to the Otay River Floodplain Site, and no mitigation is required.

Fisheries

The proposed restoration activities at the Otay River Floodplain Site could result in indirect impacts to fish when the restored area is open to tidal action, During the period when the Otay River Floodplain Site is being breached, there is a potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the opening of the site. The potential for indirect impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-3~~1~~ and MM-HYD-4. No other significant indirect impacts to fisheries are anticipated.

Pond 15 Site

Wildlife

Temporary indirect impacts related to disturbance from construction noise and activity would affect bird use in habitat areas adjacent to the Pond 15 Site. This disturbance could occur Monday through Friday from 7 a.m. to 7~~6~~ p.m. from September to February for up to 3 ~~to 7~~ years. Areas that could be affected include the Palomar channel; portions of Ponds 13, 14, 24, and 25; and the mudflats and open water areas of San Diego Bay situated along the edges of Pond 15. Because noise associated with construction would only occur outside the breeding season, no impacts would occur.

Similar to the direct impact analysis for the Pond 15 Site, indirect impacts to nesting birds could result from the proposed restoration activities at the Pond 15 Site. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2 and adherence to MM-BIO-10.

As a result, implementation of Alternative B would not result in any significant indirect impacts to nesting birds in and adjacent to the Pond 15 Site, and no mitigation would be required.

The potential for indirect impacts to eelgrass as a result of implementing Alternative B would be mitigated through adherence to MM-BIO-12~~1~~.

Fisheries

The proposed restoration activities at the Pond 15 Site could result in indirect impacts to fish when the restored area is open to tidal action. During the period when the Site is being breached, there is a potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the opening of the site. The potential for indirect impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-1and MM-HYD-2. No other significant indirect impacts to fisheries are anticipated.

San Diego Unified Port District Lands

Potential indirect impacts to wildlife and fisheries for the Port lands are the same as described for the Pond 15 Site.

Project Features

Temporary indirect impacts related to disturbance from construction noise and activity would affect bird use in habitat areas adjacent to the project site. This disturbance could occur Monday through Friday from 7 a.m. to 7~~6~~ p.m. from September to February for up to 3 ~~to 7~~ years. Because noise associated with construction would only occur outside the breeding season as a result of adherence to MM-BIO-10, no impacts would occur.

Similar to the direct impacts of the project features, indirect impacts to nesting birds could result from the proposed restoration activities at the project features. However, Construction Methods, as addressed in Section 2.3.2.4 and adherence to MM-BIO-10, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant indirect impacts to nesting birds or other wildlife in or adjacent to the project features, and no mitigation would be required.

The proposed project features are implemented as part of the restoration activities. Impacts on fish could result when rock is added to the bank along the channel and when protection for the bikeway bridge is implemented within the channel. With implementation of the project Construction Methods outlined in Section 2.3.2.4 and MM-HYD-3, MM-HYD-4~~1~~, and MM-BIO-11, indirect impacts to wildlife and fish from project features would be less than significant.

Mitigation Measures

Implementation of Alternative B would create and enhance natural coastal wetlands that would support numerous fish and wildlife species that occur or potentially occur on the project site and in the San Diego Bay NWR. The conversion of wildlife species habitat at the Otay River Floodplain Site, Pond 15 Site, and project features would be more than offset by the restoration of approximately 115.83 ~~124.41~~ acres of tidally influenced and upland transitional habitat in this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in the Otay River Floodplain Site and Pond 15 Site to support a range of fish and wildlife species, while also restoring historical wetland values at both locations. To avoid direct or indirect impacts to fisheries, including eelgrass, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, and MM-BIO-12~~1~~ would be implemented under Alternative B.

MM-BIO-12~~1~~ Eelgrass. Eelgrass (*Zostera* spp.) surveys, consistent with the requirements outlined in the 2014 California Eelgrass Mitigation Policy (CEMP), shall be conducted to detect any impacts to eelgrass in the vicinity of the proposed action as a result of breaching Pond 15 and/or opening the proposed restoration area on the Otay River floodplain to tidal action. Pre-breaching surveys for Pond 15 shall be conducted in San Diego Bay from the proposed opening of Pond 15 to the southeast corner of the Chula Vista Wildlife Reserve and at an appropriate reference site. Pre-opening surveys for the proposed restoration area on the Otay River floodplain shall be conducted in the Otay River channel between the opening of Pond 10 and the outlet in Pond 11; in the tidal channels of Ponds 10 and 11; and at an appropriate reference site. The same surveys shall be conducted within 30 days of breaching Pond 15 and 30 days of opening the Otay River floodplain tidal basin to the Bay.

If impacts to eelgrass from implementation of the proposed action are identified, mitigation shall be provided in compliance with the CEMP. The Service shall develop an Eelgrass Mitigation Plan that includes a description of the impact, identification of a mitigation site that provides mitigation at the appropriate ratio, identification of a suitable local reference site, success criteria for the mitigation site and a monitoring plan for the mitigation and reference sites. Monitoring reports shall be filed with the resource agencies and the Executive Director of the California Coastal Commission.

4.3.3.3 Alternative C

Under Alternative C, the Otay River Floodplain Site would be recontoured to create a subtidal channel, intertidal mudflats (including frequently flooded and frequently exposed zones), and intertidal coastal salt marsh mudflat (including low, mid, and high marsh zones). The Pond 15 Site would also be recontoured to create similar but deeper subtidal and marsh zones. As discussed in Section 2.3 of this EIS, 33.51 acres of wetlands and transitional upland habitat would be planted at the Otay River Floodplain Site by 2020. Approximately 90.90 acres of wetlands and transitional upland habitat would be planted at the Pond 15 Site by 2020. The restored areas would contribute to the south San Diego Bay ecosystem by providing additional terrestrial habitat for wetland-dependent wildlife species and important shallow-water habitat for a variety of fish that represent a major forage resource for predatory fish and avian species.

Direct and Indirect Impacts

Otay River Floodplain Site

The potential direct and indirect impacts to fisheries and wildlife, including wintering waterfowl and migrant and wintering shorebirds, from implementation of Alternative C in the Otay River Floodplain Site would be the same as those described for Alternative B.

Pond 15 Site

The potential direct and indirect impacts to fisheries and wildlife, including wintering waterfowl and migrant and wintering shorebirds, from implementation of Alternative C in the Pond 15 Site would be the same as those described for Alternative B.

San Diego Unified Port District Lands

Potential direct and indirect impacts to fisheries and wildlife from implementation of Alternative C for the Port lands are the same as described for Alternative B.

Project Features

The potential direct and indirect impacts to fisheries and wildlife, including wintering waterfowl and migrant and wintering shorebirds, from implementation of Alternative C in the project features would be the same as those described for Alternative B.

Mitigation Measures

Mitigation requirements for Alternative C would be the same as for those described for Alternative B.

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4.4 CULTURAL RESOURCES

Section 106 (16 U.S.C. 470f) of the National Historic Preservation Act requires federal agencies, prior to taking action, to take into account the effects of their undertaking on historic properties. Specific regulations regarding compliance with Section 106 state that although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency is ultimately responsible for ensuring that the process is completed according to statute. The four steps in the Section 106 process are as follows:

- Identify and evaluate historic properties.
- Assess effects of the project on historic properties (if no adverse effects are identified, no additional steps are necessary).
- Resolve any adverse effects of the project on historic properties in consultation with the State Historic Preservation Office (SHPO)/Tribal Historic Preservation Officer and other interested parties, resulting in a mitigation strategy.
- Implement mitigation if necessary.

Prior to evaluating the potential effects of a proposed action, it is necessary to conduct a survey of the area of potential effects (APE). This is followed by determining whether any resources located within the APE have been identified as eligible for inclusion in the National Register of Historic Places (NRHP). The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The APE is influenced by the scale and nature of a proposed action, and may be different with reference to different effects of the action. In addition, the APE is not always a contiguous area, as there may be multiple alternative project sites or multiple areas in which changes are anticipated.

An effect to cultural resources would be considered adverse if a resource listed in or eligible for listing in the NRHP could be physically damaged or altered, isolated from the context associated with its listing, or affected by a proposed action's elements that would be out of character with the property or its setting. In addition, Title 36 of the Code of Federal Regulations, Part 800, defines effects and adverse effects on historic resources as follows:

> (1) *Criteria of adverse effect*. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have

been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative (36 CFR, Section 800.5(a)(1)).

According to Section 800.5(a)(2), examples of potentially significant impacts on historic properties include the following:

(i) Physical destruction, damage, or alteration of all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR, Section 800.5(a)(2)).

4.4.1 Alternative A

Six cultural resources were identified within the APE for the Otay River Estuary Restoration Project (proposed action), consisting of four prehistoric archaeological sites (SDI-19,712, SDI-20,686, SDI-7455, and SDI-20,765) and two historic period sites (Salt Works-P-37-026582 and the Coronado Belt Line-SDI-13,073). SDI-7455 and Salt Works-P-37-026582 are considered eligible for listing in the NRHP.

Under Alternative A, no excavation within the Otay River Floodplain Site or alterations to the existing salt ponds within the San Diego Bay National Wildlife Refuge would occur. Instead, the portion of the project site located within the Otay River floodplain would continue to receive minimal management (e.g., mowing of weeds east of Nestor Creek, occasional site visits to conduct wildlife and habitat monitoring west of Nestor Creek). Pond 15 and the surrounding levees would continue to support the existing solar salt operation on the site. These activities are not expected to affect any resource listed in or eligible for listing in the NRHP, or physically damage or alter, isolate from the context associated with its listing, or affect a cultural resource. Further, management within the project site under Alternative A would be conducted in accordance with the requirements of 36 CFR Sections 800.5(a)(1) and 800.5(a)(2). Therefore, no impacts to cultural resources would occur.

Mitigation Measures

No effects to cultural resources would occur; therefore, no mitigation measures are required.

4.4.2 Alternative B

Alternative B would include restoration of native wetland habitat by excavating portions of the Otay River floodplain, including Pond 20a, and using much of the excavated fill to raise the elevations in Pond 15 to levels appropriate for supporting salt marsh vegetation. This alternative would also include breaching Pond 15 to restore tidal exchange within the pond. The levees of several adjacent ponds would also be altered to support tidal wetland restoration in Pond 15.

P-37-026582 (Western Salt Company Salt Works)

As described in Section 3.4, in 2002 the SHPO determined that the historic-period Western Salt Company Salt Works facility was eligible for the NRHP as a historic district under Criteria A and C, as defined by 36 CFR Part 60.4. The proposed restoration of the Otay River Floodplain Site and the Pond 15 Site under Alternative B, as well as associated project features depicted in Figure 2-1a in Chapter 2, including raising the levee between Ponds 22 and 23, would affect this historic-period resource.

In 2001, the U.S. Fish and Wildlife Service (Service), in recognition of the significance of this resource and the need to address future proposals to modify the salt pond levees, entered into a Memorandum of Agreement (MOA) with the SHPO regarding restoration of the Western Salt Company Salt Works Ponds 10, 10a, and 11. The MOA included two stipulations for addressing effects to the NRHP-eligible resource: (A) recordation of historic properties to Historic American Landscape Survey (HALS) standards and preparation of a HALS written report and (B) interpretation of the solar salt industry at the South San Diego Bay Unit. In accordance with stipulation A, the Service commissioned a HALS in 2001 (NPS 2001). The HALS was completed as mitigation for earthen levee breaches related to restoration of coastal salt marsh, and was intended to act as mitigation for adverse effects to all earthen levees associated with the resource. All required stipulations were completed, meeting the terms of the MOA, and the MOA was subsequently terminated in 2013 (Appendix K2).

To restore tidal exchange and support coastal wetland restoration in Pond 15, Alternative B would include breaching the northern earthen levee of Pond 15 and reconnecting the pond to San Diego Bay. In addition, to ensure that tidal flows do not breach the remaining levees around Pond 15, these levees would be reinforced with fill material as part of the salt marsh restoration process. The locations and brief descriptions of other permanent and temporary modifications to levees within the salt works are presented in Chapter 2 and shown in Figure 2-1a. The proposed action would include removing the northern levee of Pond 20a to accommodate restoration of historic salt marsh habitat; creating a new levee at the southern edge of restored habitat to protect the remaining portion of the historic Pond 20, owned by the Port of San Diego, from tidal inundation; raising the elevation of the levee between Ponds 22 and 23 to address changes in flood flows as a result of the proposed restoration; and modifying the levees in Ponds 13 and 14 to provide a new connection to the remaining solar salt ponds and ensure that continued use of these ponds remains part of the existing solar salt evaporation process. These activities would impact this resource; however, the impacts are not considered significant because the Service-commissioned HALS serves as mitigation for all such activities. Nevertheless, additional photodocumentation and resource record updates have been completed for Pond 15, and additional interpretation of the historic salt works would be developed as described under Mitigation Measure (MM) CUL-1 (see Mitigation Measures section at the end of this section). Implementation of MM-CUL-1 would ensure that impacts to this resource would be less than significant.

SDI-7455

Dudek’s evaluation concluded that the deposits associated with this resource are most likely related to the ethnohistoric village of La Punta, identified in 1782, and that these deposits are eligible for the NRHP under Criterion A (Significant Historical Events) and Criterion D (Scientific Data Potential) (Appendix K). Therefore, any earth movement within the deposits related to Alternative B would constitute a significant impact. Alternative B would not affect any portion of this resource because it is located outside of the Otay River Floodplain Site, outside of the Pond 15 Site, and outside the footprint of any project features (Appendix K). Therefore, no effects to this resource from implementation of Alternative B are anticipated.

SDI-13,073 (Coronado Belt Line Railroad)

This historic-period resource is located just to the north and outside the boundaries of the Otay River Floodplain Site. The historic tracks are also present along Bay Boulevard east of the Pond 15 Site. This resource was determined not eligible for listing in the NRHP (USFWS 2009); however, the remaining track is considered historically important to the local community. The resource itself would not be modified following implementation of Alternative B, and its setting, location, and integrity would not be altered in any way. Although the resource would not be modified under Alternative B, the existing tracks would be crossed by construction vehicles to gain access to the Pond 15 Site; therefore, MM-CUL-2 is provided (below). MM-CUL-2 would include installation of temporary ballasts and/or protective track coverings to protect the rails in place at the point where construction vehicles would cross the tracks to access the Pond 15 Site. Following implementation of MM-CUL-2, no effects to this site would occur.

SDI-19,712

This small prehistoric artifact scatter is located within the Otay River Floodplain Site in the area proposed for grading and habitat restoration under Alternative B. During geotechnical exploration and archaeological testing, no substantial cultural deposits were identified (Dudek 2012). As a result of the evaluation performed by Dudek, the site was recommended as not eligible for listing in the NRHP under any of the criteria (Appendix K). Therefore, impacts to this resource as a result of implementation of Alternative B would be less than significant.

SDI-20,686

This prehistoric resource is a lithic scatter. The general area surrounding and including this resource has been subject to a number of past disturbances, including agricultural use. As addressed in Section 3.4, this resource is not considered eligible for NRHP listing under any of the associated significance criteria. Therefore, impacts to this resource as a result of implementation of Alternative B would be less than significant.

SDI-20,765

Located east of the Otay River Floodplain Site within the area proposed for revegetation east of Nestor Creek, this resource consists of a small scatter of prehistoric artifacts situated near and on top of chunks of asphalt and concrete. It was determined that no primary archaeological deposits exist in the vicinity (Appendix K). As such, the resource is considered not eligible for NRHP listing under any of the associated significance criteria, and impacts to this resource as a result of implementation of Alternative B would be less than significant.

Unidentified/Undiscovered Cultural Resources and Human Remains

The proposed action would include grading and earthmoving activities that could result in potential impacts to undiscovered cultural resources. To reduce unanticipated impacts to cultural resources, MM-CUL-3 and MM-CUL-4 are provided (see Mitigation Measures). Implementation of these measures would reduce impacts to undiscovered cultural resources to a level that is less than significant.

Additionally, because the proposed action would include grading and earthmoving activities, the potential exists to encounter undiscovered human remains. To reduce potentially significant impacts associated with the discovery of human remains, MM-CUL-5 is provided. Implementation of MM-CUL-5 would reduce unanticipated impacts to undiscovered human remains to less than significant.

Mitigation Measures

The following mitigation measures have been incorporated into the scope of the proposed action to ensure that potential effects to cultural resources would be avoided:

MM-CUL-1 Prior to commencement of any project excavation, a Memorandum of Agreement between the U.S. Fish and Wildlife Service (Service) and the State Historic Preservation Office (SHPO) shall be signed that requires the following stipulations to be completed within 1 year of the commencement of project excavation: (1) in addition to the existing Historic American Landscape Survey (HALS) documentation, entitled *Cultural Resources Evaluation for the U.S. Fish and Wildlife Service Otay River Estuary Restoration Project, Otay Mesa, San Diego County, California* (Appendix K), supplemental photodocumentation will be conducted for Ponds 13, 14, and 15 and the northern portion of Pond 20A; (2) oral history research will be conducted to document the history of the salt works and its ultimate inclusion in the San Diego Bay National Wildlife Refuge (NWR), as well as the 100-year-plus salt-making process at this site; (3) an overview of the salt works history will be posted on the NWR website; ~~and~~ (4) an interpretive panel that expands upon the interpretation already developed to inform visitors of the historic significance of the salt works and an interpretive panel developed in partnership with the Sycuan Bancd of the Kumeyaay Nation, which addresses traditional ecological knowledge and resource exploitation of San Diego Bay, will be designed, fabricated, and installed on the NWR; and (5) a link to an appropriate website addressing the history of the Kumeyaay Nation will be posted on the Refuge website.

MM-CUL-2 The Service shall ensure that prior to the commencement of construction activities at either the Otay River Floodplain Site or the Pond 15 Site, the construction contractor has implemented protective measures such as temporary ballasts, wood beams, or other protective crossing mechanisms to protect the historic rail tracks located along Bay Boulevard at the construction access point to the Pond 15 Site. These temporary protective measures shall be periodically inspected to ensure their integrity and shall remain in place until all construction activity has ceased within the Pond 15 Site.

MM-CUL-3 A qualified archaeologist meeting the Secretary of the Interior's Standards and Guidelines: Professional Qualifications Standards and a qualified Kumeyaay cultural monitor shall monitor all grading and subsurface disturbance within the project's area of potential effect. If any cultural resources are discovered during excavation, all earthwork in the vicinity shall be halted and the Service's Regional Historic Preservation Officer shall be immediately contacted to review the materials and recommend a treatment that is consistent with applicable laws and policies.

In addition to standard monitoring techniques, for monitoring in wet areas the archaeological and Kumeyaay cultural monitors will select 5-gallon samples of excavated sediment to be screened through 1/8 inch wire mesh screen. Wet sediments may be stockpiled and dried prior to sampling by the monitors, before sediments are re-compacted as fill on site or hauled off site.

If artifacts or other resources are identified, then the Project archaeologist will determine, in consultation with the Service's Regional Historic Preservation Officer, if the discovery constitutes a potential intact resource. If potential intact resources are discovered, then the notification and treatment methods outlined in Mitigation Measure MM-CUL-4 would be implemented.

The treatment plan would likely require the boundaries of the site to be defined before excavation can be reinitiated in the vicinity of the discovery. The site shall be recorded and evaluated for eligibility for listing in the National Register of Historic Places (NRHP). Once this work is completed, additional measures may be required, depending on the results of the eligibility determination. If any site is encountered that is determined to be eligible for listing in the NRHP, the Service shall consult with the SHPO, federally recognized t~~T~~ribes, and interested parties, and additional measures may be required.

The archaeological and Kumeyaay cultural monitors shall provide a monitoring report to the Service's Regional Historic Preservation Officer and the San Diego Bay NWR Manager describing the activities and findings of the monitoring effort within 30 days of the completion of all monitoring activity. Summaries of all actions taken related to the discovery of cultural resources during site excavation shall be provided to the Service's Regional Historic Preservation Officer and the NWR Manager within 15 days of completion of the action.

MM-CUL-4 All archaeological resources encountered on the San Diego Bay NWR shall be handled in accordance with federal regulations. With respect to artifacts collected on the San Diego Bay NWR, either as part of site investigations and recovery or inadvertent discovery during excavation, the Service will ensure proper care of Federally owned and administered archaeological collections, including ensuring that prehistoric and historic artifacts and associated records are deposited in an institution with adequate long-term curatorial capabilities that can provide professional, systematic, and accountable curatorial services on a long-term basis. The curation institution will meet the federal curation standards as required in 36 CFR 79.

MM-CUL-5 In the event of the inadvertent discovery of human remains, the Service's Regional Historic Preservation Officer and the San Diego County Coroner shall be immediately contacted per the Native American Graves Protection and Repatriation Act (NAGPRA) Section (3)(d)(1). All earthwork in the vicinity of the discovery shall be halted and the discovery site shall be secured from further disturbance. If the remains are determined to be Native American, all required NAGPRA inadvertent discovery procedures, including, but not limited to, initiating consultation with the Kumeyaay Cultural Repatriation Committee, developing a plan of action, and repatriating any NAGPRA cultural items (i.e., funerary objects, sacred objects, objects of cultural patrimony) and/or human remains, shall be followed.

Implementation of these measures would avoid effects to cultural resources under Alternative B.

4.4.3 Alternative C

Under Alternative C, the APE would include the same areas as described for Alternative B; however, excavation within the Otay River Floodplain Site footprint would be deeper to support subtidal habitat. Specifically, this alternative would require excavation of 370,000 cubic yards of fill material in the Otay River Floodplain Site, approximately 50,000 cubic yards more than for Alternative B. Because the APE for Alternative C would be the same as that described for Alternative B, the analysis of the potential adverse effects to cultural resources under Alternative C would be essentially the same as that described for Alternative B.

Mitigation Measures

As described under Alternative B, MM-CUL-1 through MM-CUL-5 would be implemented under Alternative C; therefore, potential impacts to cultural resources from implementation of Alternative C would be less than significant.

4.5 SOCIAL AND ECONOMIC ENVIRONMENT

4.5.1 Land Use

This section analyzes the potential land use conflicts between the proposals presented in each alternative and the existing and planned land uses in the immediate vicinity of the two project sites for the Otay River Estuary Restoration Project (ORERP, or proposed action). The analysis also addresses consistency with coastal management policies, including the California Coastal Act.

Significance Threshold: Impacts to land use would be considered significant if substantial changes in use or intensity of use could occur on the project site that would affect adjacent or nearby properties. A significant impact to land use would also occur if an action or the activities proposed in association with the action would be inconsistent with applicable land use regulations (e.g., Coastal Zone Management Act of 1972, as amended; California Coastal Act).

4.5.1.1 Alternative A

Under Alternative A, the no action alternative, there would be no change to the existing land use conditions at either portion of the project site. Habitat and wildlife management would remain unchanged, as would operations at the salt works. Therefore, this alternative would not result in any potential land use conflicts to existing, permitted, or planned uses on or near the San Diego Bay National Wildlife Refuge (NWR) and other adjacent areas.

Mitigation Measures

No significant impacts are anticipated; therefore, no mitigation measures are required.

4.5.1.2 Alternative B

As indicated in Table 4.5-1, tidal restoration of the Otay River Floodplain Site and the Pond 15 Site, as proposed under Alternative B, is consistent with goals and recommendations included within the *San Diego Bay NWR Comprehensive Conservation Plan* (USFWS 2006). In addition, the proposed restoration under this alternative is also consistent with the resource goals and objectives of the Multiple Species Conservation Program, which designates the project site as riparian/wetlands. Specifically, the overarching goal of the Multiple Species Conservation Program is to maintain and enhance biological diversity in the region and conserve viable populations of endangered, threatened, and key sensitive species and their habitats, thereby preventing local extirpation and ultimate extinction, and minimizing the need for future listings, while enabling economic growth in the region (City of San Diego 1997). Under this alternative, each component of this overarching goal would be achieved, as outlined in further detail in Section 4.3, Biological Resources, of this Environmental Impact Statement (EIS).

Table 4.5-1
Consistency with San Diego Bay NWR Comprehensive Conservation Plan

South San Diego Bay Unit Goals	Goal/Recommendation	Alternative B	Alternative C
Goal 1	Protect, manage, enhance, and restore open water, coastal wetlands, and native upland habitat to benefit the native fish, wildlife, and plant species supported within the South San Diego Bay Unit.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands, which is consistent with this goal.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands, which is consistent with this goal.
Goal 2	Support recovery and protection efforts for the Federally and State listed threatened and endangered species and species of concern that occur within the South San Diego Bay Unit.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands that could provide habitat for several threatened and endangered species and species of concern, which is consistent with this goal.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands that could provide habitat for several threatened and endangered species and species of concern, which is consistent with this goal.
Goal 3	Provide high-quality foraging, resting, and breeding habitat for colonial nesting seabirds, migratory shorebirds, and waterfowl and saltmarsh-dependent species.	Although this alternative would replace habitat that currently provides foraging opportunities for some species, the restored habitat would provide high-quality wetland habitat to support a greater diversity of species, as well as providing nesting opportunities for seabirds and some shorebirds. Open water habitat would continue to be present in adjacent ponds. Therefore, Alternative B would be consistent with this goal.	Although this alternative would replace habitat that currently provides foraging opportunities for some species, the restored habitat would provide high-quality wetland habitat to support a greater diversity of species, as well as providing nesting opportunities for seabirds and some shorebirds. Open water habitat would continue to be present in adjacent ponds. Therefore, Alternative C would be consistent with this goal.
Goal 4	Provide opportunities for compatible wildlife-dependent recreation and interpretation that foster public appreciation of the unique natural and cultural heritage of South San Diego Bay.	Restoration under this alternative would not hinder the ability of the San Diego Bay NWR to achieve this goal. The restored habitats under this alternative would provide the San Diego Bay NWR with additional opportunities for interpreting wetland species. This alternative would be consistent with this goal.	Restoration under this alternative would not hinder the San Diego Bay NWR's ability to achieve this goal. The restored habitats under this alternative would provide the San Diego Bay NWR with additional opportunities for interpreting wetland species. This alternative would be consistent with this goal.

NWR = National Wildlife Refuge.

Section 307(c)(1) of the Coastal Zone Management Act, as amended, requires that Federal agency activities that impact any land or water use or natural resource of the coastal zone be consistent with the affected State's coastal management program, in this case the California Coastal Management Program, to the "maximum extent practicable." Section 930.32 of the National Oceanic and Atmospheric Administration's regulations implementing the Coastal

Zone Management Act (15 CFR, Part 930) defines "consistent to the maximum extent practicable" as follows:

> The term "consistent to the maximum extent practicable" means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency (15 CFR 930.32(a)(1)).

Based on a detailed analysis of the consistency of the actions and proposed outcomes of implementing Alternative B with the principal component of the California Coastal Management Program, namely the planning and management policies presented in Chapter 3 of the California Coastal Act, as presented in Appendix N of this EIS, the implementation of Alternative B would be consistent to the maximum extent practicable with the policies of the California Coastal Act.

Additionally, a 0.79-acre portion of the Pond 15 Site area would be located within the Port of San Diego (Port) jurisdiction, as shown on Figure 2-1b. This 0.79-acre area is designated as Wetlands in the Port Master Plan (Port 2015). In regards to Wetland land uses, the Port Master Plan states, "development shall be limited to restoration, nature study or similar resource-dependent activities. Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Any diking, filling or dredging occurring in these areas shall maintain or enhance function capacity of the wetlands" (Port 2015). The Pond 15 Site inlet/outlet improvements would be conducted in support of the project's overall wetland creation objectives and to enhance the wetlands functional use by terrestrial and aquatic species. Mitigation measures MM-BIO-2, MM-BIO-5, MM-BIO-7, MM-BIO-9 and MM-BIO-11 ~~10~~ would be implemented to mitigate potential impacts to sensitive species and habitat that may occur within the Pond 15 levee breach inlet/outlet area to a level that is less than significant. Therefore, implementation of Alternative B would not result in a change in designation to this land use or conflict with the goals and policies of the Port Master Plan related to Wetlands.

With coordination throughout the planning and implementation of this alternative with the adjacent jurisdictions, including the cities of San Diego, Imperial Beach, and Chula Vista and the Port of San Diego, no significant adverse land use impacts to these agencies' land use goals are anticipated. Further, no aspect of Alternative B would interfere with nearby aircraft or military operations. The proposed change to the project site would also not result in any conflicts with existing or future allowable land uses on adjacent properties, which include open space, industrial use, and residential use. Therefore, no significant impacts related to land use are anticipated.

Moreover, under Alternative B, the current habitat and wildlife management activities occurring on the Otay River Floodplain Site would change from upland habitat management to wetland management, and the Pond 15 Site would be converted from solar salt pond to tidally influenced wetland habitat. The change in habitat type associated with the proposed action would have no substantive impact on surrounding land uses, with the exception of flooding off site, which would result in a beneficial impact from the raising of the levee between Pond 22 and Pond 23. Raising the levee would reduce downstream flooding during a 100-year storm event (see Section 2.3.2, Features Common to Both Action Alternatives). However, construction activities related to the excavation and transport of material from the Otay River Floodplain Site to the Pond 15 Site would temporarily affect the views of the site from surrounding land uses and could produce noise audible from nearby residential and recreational uses. Although these temporary impacts could be considered a nuisance by some residents, the site is far enough from nearby residences that no significant temporary compatibility issues are anticipated, as analyzed in Section 4.2.7, Noise.

Access to the Bayshore Bikeway and the bike path along Saturn Boulevard would be temporarily affected during the construction period. To minimize any disruption to commuter and recreational bicyclists and pedestrians using these bike paths, Mitigation Measure (MM) REC-1 is provided, which would require a flagger to be present during construction to ensure safe access to these paths from Main Street and safe access to the Bay Boulevard portion of the Bayshore Bikeway at the construction access point to the Pond 15 Site. MM-REC-2 is also provided, which would require that the Saturn Boulevard bike path be temporarily realigned to ensure continued access between Main Street and Palm Avenue. With the incorporation of these measures into the scope of the project, no significant impacts to bicycle and pedestrian uses in the area would occur. Additionally, no disruption of use along the Otay Valley Regional Park trail, located to the east of the construction area, is anticipated.

Restoration of the Pond 15 Site and the removal of Pond 15 from the existing solar salt pond operation would reduce, to some extent, the annual production of salt from the solar salt operation. To minimize the impact of removing Pond 15 from the salt operation, the levees around the adjacent ponds would be reconfigured to eliminate any connection to Pond 15 and would be strengthened to avoid disruption of the overall system. Installation of levees and other reinforcement mechanisms would ensure that Pond 15 would function independently of the overall salt pond system operations; therefore, any potential impact the salt ponds may have on the newly restored habitat within Pond 15 would be less than significant.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.1.3 Alternative C

The potential impacts to land use from the implementation of Alternative C would be the same as those described for Alternative B. Alternative C would also be consistent to the maximum extent practicable with the principal components of the California Coastal Management Program, namely the planning and management policies presented in Chapter 3 of the

California Coastal Act, as presented in Appendix N to this EIS. Similar to Alternative B, Alternative C would also be consistent with the Port Master Plan following implementation of mitigation measures MM-BIO-2, MM-BIO-5, MM-BIO-7, MM-BIO-9 and MM-BIO-11 ~~10~~ which would mitigate potential impacts to sensitive species and habitat that may occur within the Pond 15 levee breach inlet/outlet area to a level that is less than significant. Therefore, land use impacts associated with implementation of Alternative C would be less than significant.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.2 Traffic, Circulation, and Parking

This section presents the estimated level of traffic that could be generated by the construction/ restoration activities associated with the various alternatives. Also included in this section is an analysis of the potential impacts of project-related traffic on local and regional traffic circulation and an analysis of the impacts that an increased demand for parking could have on the surrounding area.

Significance Threshold: Impacts related to traffic would be considered significant if project-related traffic would exceed accepted increases in roadway volume-to-capacity ratios as established by the affected jurisdictions; if road capacities would be exceeded; if sight distance provided at ingress/egress points would be inadequate; or if the proposed action would substantially alter the demand for on- and/or off-street parking spaces.

4.5.2.1 Alternative A

Under this alternative, the Otay River Floodplain Site would remain undeveloped and inaccessible to the public, and would generate a minimal number of vehicle trips associated with maintenance activities for the San Diego Bay NWR. Vehicle trips associated with South Bay Salt Works operations would remain consistent with the existing condition. This alternative would not result in any additional trip generation; therefore, no significant adverse impacts related to traffic (including impacts to existing road capacity) or parking are anticipated.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.2.2 Alternative B

Under Alternative B, approximately 320,000 cubic yards of material would be excavated from the Otay River Floodplain Site, of which approximately 260,000 cubic yards would be transported to the Pond 15 Site, while the remaining material would be used to construct the project features and place an exposure reduction cover, as described in Chapter 2, over an area of high DDT levels on the Otay River Floodplain Site east of Nestor Creek. Construction methods have not yet been finalized for transportation of the excavated material from the Otay River Floodplain Site to the Pond 15 Site. The ~~three~~ two options proposed include the use of a conveyor belt~~,~~ or transporting the material in 12-cubic-yard haul trucks~~, or routing it through a slurry pipeline~~, as outlined in detail in Section 2.3.2. To be conservative, this analysis assumes that the material would be transported between sites on haul trucks using area roadways because this would have the most substantial impact on transportation and circulation.

Table 4.5-2 lists the trips associated with construction under Alternative B. Transporting 260,000 cubic yards of material from the Otay River Floodplain Site to the Pond 15 Site would require approximately 56,000 total one-way truck trips (or 28,167 round-trips) based on the 12-cubic-yard capacity of the haul trucks proposed for construction and a bulking factor of 1.3 (Appendix E). Assuming 209 working days, as proposed under a 6-day work week and avoidance of the core nesting season, approximately 270 one-way haul truck trips per day would be required to haul the 260,000 cubic yards of material from the Otay River Floodplain Site to the Pond 15 Site.

Table 4.5-2
Alternative B Maximum Daily Trip Generation

Activity	Start Date	Finish Date	Duration (months)	Work Days[a]	Hauling Truck Trips Per Day	Construction Worker Trips	Vendor Trips and Material Deliveries
Mobilization	8/1/2017	9/30/2017	2	53	0	50	20
Dewatering Pond 15	10/1/2017	11/1/2017	1	27	0	50	20
Earthwork	10/1/2017	1/31/2018	4	105	270	50	48
Demobilization	2/1/2018	2/28/2018	1	24	0	50	20
Core nesting season	3/1/2018	7/31/2018	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2018	8/31/2018	1	27	0	50	20
Earthwork	9/1/2018	12/31/2018	4	104	270	50	48
Demobilization	1/1/2019	2/28/2019	2	51	0	50	20
Core nesting season	3/1/2019	7/31/2019	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2019	8/31/2019	1	27	0	50	20
Pond15 Site grading	9/1/2019	12/31/2019	4	87	0	50	20

Notes: N/A = not applicable.
[a] Based on 6 work days a week

In total, it is estimated that approximately 270 truck trips per day would take place between the Pond 15 Site and the Otay River Floodplain Site from about 7 a.m. to 7 p.m. Monday through Saturday during the proposed action. The haul route is presented on Figure 2-2, Truck Haul Route. The roadways to be used for material transport include a local street and a two-lane light collector. On any given day when the trucks would be operating, hauling trucks would be present on these streets on a regular basis throughout the day, with one truck leaving the Otay River Floodplain Site every 5 minutes, resulting in about 24 trucks along the route in a 1-hour period. In addition to the truck trips that would be generated under this transport option, up to 50 additional daily construction worker (truck driver) trips could be generated, and an additional 20 vendor trips or material deliveries would be generated throughout the construction period. Although the addition of trucks on the road during hauling activities would result in additional congestion on the haul truck route roadways, based on the low volume of traffic on the roads designated as the haul route (see Table 3.5-1), the presence of 25 trucks per hour (approximately one truck every 2–3 minutes) would not be expected to cause substantial congestion that would interfere with the use of the roads by existing traffic or interfere with access to the properties along the route.

Generally, the material deliveries, vendor trips, and construction worker trips would not overlap with the haul truck trips because construction workers would generally arrive early in the morning, before other trips associated with project construction. Additionally, material deliveries would be intermittent and would vary depending on project needs. Moreover, no truck trips would be generated during the 4-month core nesting season because construction would temporarily cease in order to avoid biological impacts, as discussed further in Section 4.3 of this EIS.

To minimize traffic congestion, all large construction equipment being delivered or removed from the site via ground transport would access the site only via Main Street and only during off-peak traffic hours.

Construction access to the Pond 15 Site would be through a San Diego Bay NWR easement located off Bay Boulevard just north of the intersection of Bay Boulevard and Palomar Street. To provide access to the site for construction equipment during construction, temporary dirt roads would be established and maintained for public safety. Access to both portions of the project site would be controlled through the use of gates, fencing, and site security services. Traffic flow in and out of the construction sites would be controlled by a flagger to avoid traffic congestion as haul trucks move in and out of the site and to ensure public safety along the Bayshore Bikeway and on the Otay Valley Regional Park trail and temporary alignment of the Saturn Boulevard bike path.

As shown on Figure 2-2, loaded haul trucks from the Otay River Floodplain Site would exit the site onto West Frontage Road, turn left onto Anita Street, turn right onto Bay Boulevard, cross Palomar Street, and then turn left off Bay Boulevard onto a San Diego Bay NWR easement. To dispose of the material transported from the Otay River Floodplain Site to Pond 15 Site, trucks would travel along the levee surrounding the Pond 15 Site via a loop to be created to facilitate efficient truck movement within the site. The total round-trip loop between the Otay River Floodplain Site and Pond 15 Site is approximately 7 miles and would take approximately 36 minutes. It is anticipated that the haul truck trips between the two sites would occur during both earthwork phases, and would not occur during the demobilization proposed during the core nesting season.

The roadways where the material would be transported include West Frontage Road, Anita Street, and Bay Boulevard (a two-lane light collector, a local street, and a two-lane light collector respectively). Although capacities on the affected streets are low (refer to Table 3.5-1), all but Main Street are operating well above level of service (LOS) D. The segment of Main Street between West Frontage Road and Interstate 5 (I-5) currently operates below LOS D, with a capacity of 9,000 average daily trips and an estimated volume of 23,500 average daily trips. The majority of this traffic is likely coming from the southbound I-5 exit to travel east on Main Street. The proposed truck traffic would not interfere with that traffic pattern, because it would travel on Main Street only to West Frontage Road, located to the west of the I-5 off-ramp. This, along with traffic control at the exit from the construction site onto Main Street, would avoid any significant adverse traffic impacts on this road segment. With the implementation of MM-TRA-1, the truck and other construction trips associated with implementation of Alternative B would not be expected to cause congestion that would interfere with the use of the roads by existing traffic or interfere with access to the properties along the route.

For construction workers and material deliveries, the roadways that would mainly be used to access the project sites are West Frontage Road, Anita Street, Bay Boulevard, Main Street, and I-5. These trips would not be expected to cause congestion that would interfere with the use of the roads by existing traffic or interfere with access to the properties along the route, because trips would be dispersed throughout the day. Construction staging areas would be located on the eastern side of the Otay River Floodplain Site (as shown on Figure 2-1a), which would keep construction equipment and worker vehicles out of the public roadway when not in use.

Construction worker vehicles would be parked in the staging area on the Otay River Floodplain Site, east of Nestor Creek, as shown on Figure 2-1a. Therefore, there would be no increase in demand off site for on- or off-street parking spaces. To avoid impacts to other users in the area, construction workers would not be permitted to park in trail staging areas or in areas that could pose a safety threat to users of the Bayshore Bikeway. In addition, parking in nearby parking lots would be permitted only if prior authorization has been provided by the property owner.

During and after construction, both sites would be closed to the public. Therefore, there would be no additional trips generated and no increased parking demand due to public use. Once initial restoration activities are completed, trips to the project site would occur in conjunction with site monitoring and maintenance. The number of trips associated with these activities would be small, but slightly higher than the minimal number of trips made to the site for maintenance and monitoring under existing conditions. Vehicles associated with maintenance and monitoring would park either near the staging area on the Otay River Floodplain Site or on the levees of the Pond 15 Site. Overall, once construction of the restored wetlands is complete, there would be no measurable increase in traffic or parking on area roadways resulting from this alternative.

Trips generated by the implementation of Alternative B are not expected to alter the LOS on any area roadway segment or intersection. In addition, all affected roadways and intersections operate at a LOS C or above under existing conditions, as outlined in Tables 3.5-1 and 3.5-2. Construction phase trips are not expected to result in any substantial traffic congestion on these roadways and intersections with the implementation of MM-TRA-1 and MM-TRA-2. The proposed action does not include an increased long-term transportation component. Therefore, the project would not exceed the volume-to-capacity ratios in the established applicable jurisdictions, or substantially alter the demand for on- or off-street parking spaces.

Although the average daily trips occurring on the surrounding roadways is below the current design capacity, if material deliveries, construction worker trips, and haul truck trips all occur during the peak hour, there is a potential for increased traffic congestion on area roadways. To offset these potential impacts, MM-TRA-1 and MM-TRA-2 are provided. All potentially significant impacts associated with implementation of Alternative B would be reduced to less than significant through the implementation of MM-TRA-1 and MM-TRA-2. No significant adverse impacts related to traffic and parking are therefore anticipated.

Mitigation Measures

The following mitigation measures have been incorporated to avoid or minimize potentially significant traffic impacts associated with construction activities occurring on roadways.

MM-TRA-1 Prior to the commencement of any sediment transport, a construction area traffic control plan or detour plan shall be prepared for each location where construction activities would encroach into the right-of-way of a public roadway. The plans would include, but not be limited to, such features as warning signs, lights, flashing arrow boards, barricades, cones, lane closures, flaggers, pedestrian detours, parking restrictions, and restricted hours during which lane closures would not be allowed (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the U.S. Fish and Wildlife Service (Service).

MM-TRA-2 The contractor shall schedule all deliveries of construction materials and equipment to the project site to avoid peak-hour traffic congestion (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the Service.

4.5.2.3 Alternative C

Approximately 370,000 cubic yards of material would be excavated from the Otay River Floodplain Site under Alternative C, of which approximately 310,000 would be transported to the Pond 15 Site, while the remaining material would be used to construct the project features and place an exposure reduction cover over an area of high DDT levels ~~or stockpiled~~ on the Otay

River Floodplain Site east of Nestor Creek. As described under Alternative B, construction methods have not yet been finalized for transportation of the excavated material from the Otay River Floodplain Site to the Pond 15 Site, and ~~three~~ two options for sediment transport are proposed. To be conservative, this analysis assumes that the material would be transported between sites on haul trucks using area roadways, as this would have the most substantial impact on transportation and circulation. The truck haul route proposed for Alternative C would be the same as proposed for Alternative B, as outlined on Figure 2-2.

Table 4.5-3 lists the trips associated with construction under Alternative C. Transporting 310,000 cubic yards of material from the Otay River Floodplain Site to the Pond 15 Site would require 67,100 total truck trips (or 33,550 round-trips) based on the 12-cubic-yard capacity of the haul trucks proposed for construction and a bulking factor of 1.3 (Appendix E). Assuming 209 working days, as proposed under a 6-day work week schedule and avoidance of the core nesting season, approximately 321 haul truck trips per day (approximately 29 trips per hour, or approximately 1 trip every 2 minutes) would be required to haul the 310,000 cubic yards of material between the Otay River Floodplain Site and the Pond 15 Site. Similarly to Alternative B, no truck trips would be generated during the 4-month core nesting season.

Table 4.5-3
Alternative C Maximum Daily Trip Generation

Activity	Start Date	Finish Date	Duration (months)	Work Days[a]	Hauling Truck Trips Per Day	Construction Worker Trips	Vendor Trips and Material Deliveries
Mobilization	8/1/2017	9/30/2017	2	53	0	50	20
Dewatering Pond 15	10/1/2017	11/1/2017	1	27	0	50	20
Earthwork	10/1/2017	1/31/2018	4	105	321	50	48
Demobilization	2/1/2018	2/28/2018	1	24	0	50	20
Core nesting season	3/1/2018	7/31/2018	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2018	8/31/2018	1	27	0	50	20
Earthwork	9/1/2018	12/31/2018	4	104	321	50	48
Demobilization	1/1/2019	2/28/2019	2	51	0	50	20
Core nesting season	3/1/2019	7/31/2019	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2019	8/31/2019	1	27	0	50	20
Pond15 Site grading	9/1/2019	12/31/2019	4	87	0	50	20

Notes: N/A = not applicable.
[a] Based on 6 work days a week

Trips generated by the implementation of Alternative C are not expected to alter the LOS on any area roadway segment or intersection. In addition, all affected roadways and intersections operate at a LOS C or above under existing conditions, as outlined in Tables 3.5-1 and 3.5-2. Construction phase trips are not expected to result in any substantial traffic congestion to these roadways and intersections with the implementation of MM-TRA-1 and MM-TRA-2. The proposed action does not include an increased long-term transportation component. Therefore, the project would not exceed the volume-to-capacity ratios in the established applicable jurisdictions, or substantially alter the demand for on- or off-street parking spaces.

Although the average daily trips occurring on the surrounding roadways is below the current design capacity, if material deliveries, construction worker trips, and haul truck trips all occur during the peak hour, there is a potential to cause traffic congestion on area roadways. To offset these potential impacts, MM-TRA-1 and MM-TRA-2 are provided. All potentially significant impacts associated with implementation of Alternative C would be reduced to less than significant through the implementation of MM-TRA-1 and MM-TRA-2. No significant adverse impacts related to traffic and parking are therefore anticipated.

Mitigation Measures

MM-TRA-1 and MM-TRA-2 have been incorporated to avoid or minimize potentially significant traffic impacts associated with construction activities occurring on roadways. See Section 4.5.2.2, Alternative B, for the text of these mitigation measures.

4.5.3 Public Utilities/Easements

This section analyzes the potential impacts of the various management alternatives on existing public utilities and easements in the immediate vicinity of the San Diego Bay NWR. The information provided in this section is based on the *Otay River Estuary Restoration Project Existing Utility Investigation Final Report* conducted by Everest International Consultants in August 2015, provided as Appendix L of this EIS.

Significance Threshold: Direct or indirect impacts to public utilities and easements would be considered significant if project implementation has the potential to damage existing utilities, interrupt utility service, or modify access to existing utilities.

4.5.3.1 Alternative A

This alternative would involve continuing current wildlife and habitat management practices at the Otay River Floodplain Site and retaining Pond 15 within the current configuration of the existing South Bay Salt Works. Since no changes to current operations would occur, this alternative would not result in a direct or indirect damage to utilities, utility service, or other public utility easements.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.3.2 Alternative B

Although no public utilities or easements are present within the construction footprints of the Otay River Floodplain Site or Pond 15 Site, there are a number of utilities and easements within the Otay River floodplain to the east of the construction site, as shown in Figures 3.5-2 through 3.5-6, and as described in Appendix L. Construction access to the Otay River Floodplain Site would require the creation of a temporary construction access road that would likely travel along a portion of the existing bike path east of the site boundary. Depending on the haul method chosen for transporting material from the Otay River Floodplain Site to the Pond 15 Site, this access route may function as the primary material transport route in addition to providing access to the site for project mobilization and demobilization and for construction worker access. To ensure that construction activities associated with the implementation of Alternative B do not interfere with or damage existing utilities in this area, MM-UTL-1 has been incorporated into the scope of the project. This measure requires coordination with individual utility agencies prior to U.S. Fish and Wildlife Service (Service or USFWS) approval of the 100% construction drawings to ensure that no actions associated with this proposal would damage or adversely affect utilities, utility service, or utility easements.

Mitigation Measures

The following mitigation measure has been incorporated to avoid the potential for impacts to public utilities, utility service, or utility easements associated with construction activities:

MM-UTL-1 Prior to the completion of final project construction plans, individual utility agencies with utilities located within or adjacent to areas of construction activity shall be contacted to determine the extent and type of temporary protective measures that must be implemented to prevent construction damage to surface and subsurface utilities.

4.5.3.3 Alternative C

The potential impacts to utilities, utility service, or utility easements under Alternative C would be the same as those described under Alternative B, and MM-UTL-1 would also be implemented under Alternative C to avoid or minimize damage or significant adverse impacts to utilities, utility service, or utility easements.

Mitigation Measures

MM-UTL-1 has been incorporated into the scope of the proposed action to avoid the potential for impacts to public utilities and easements associated with construction activities for Alternative C.

4.5.4 Public Access and Recreational Opportunities

Significance Threshold: Impacts to public access, education, and recreational opportunities would be considered significant if substantial modification to existing public recreation and educational activities or opportunities would occur as a result of the proposed action or if existing public access would be substantially altered.

4.5.4.1 Alternative A

No public access is currently permitted on either the Otay River Floodplain Site or the Pond 15 Site. Under Alternative A, public access would continue to be restricted on both project sites, and access to the San Diego Bay NWR would remain limited to access as approved by the Service, such as occasional guided nature tours at the South Bay Salt Works outside of the seabird nesting season. Visual access to the site during recreational activities available on the Bayshore Bikeway would remain unobstructed. Public access to the San Diego Bay for boating and fishing activities in the open waters would still be available, and no existing public access routes through the San Diego Bay NWR would be altered or removed. Under the no action alternative, there would be no significant adverse impacts to public access, educational activities, or recreational opportunities.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.4.2 Alternative B

Under Alternative B, the two project sites would continue to be closed to public access during construction and after restoration is completed. Access as approved by the Service, such as occasional guided nature tours at the South Bay Salt Works outside of the seabird nesting season, could continue but would not include the area around the Pond 15 Site while construction activities are underway. After construction, the pre-project tour route may be altered to eliminate access in the vicinity of Pond 15; however, access around other ponds in the system would continue to be available.

The Bayshore Bikeway, the 24-mile bicycle facility that extends around the San Diego Bay, passes along the northern border of the Otay River Floodplain Site in an area located outside the boundaries of the San Diego Bay NWR. General use of the Bayshore Bikeway and surrounding linkages includes recreational and commuter bicyclists, along with walkers, joggers, in-line skaters, and birdwatchers. Under this alternative, access to the Bayshore Bikeway could be disrupted for short periods. If the conveyor belt ~~or slurry~~ method of soil transport is selected, it may be necessary for construction crews to be temporarily present on the bike path while they are extending the required equipment under the path at the eastern bridge site where the path crosses the Otay River channel. In this case, a potential impact to the bike path may occur. To mitigate this potential impact, MM-REC-1 has been proposed. This measure requires signage to be provided prior to any construction work to alert bicyclists and other users of scheduled events, and requires a flagger to be present during construction activities to ensure the safety of all users.

Access to Pond 15 under either transport method would require construction vehicles to ~~If the truck transport method is selected, trucks would~~ cross the bike path just north of the intersection of Palomar Street and Bay Boulevard, with a much higher number of crossings occurring under the truck transport method. Protective devices (such as specialized rubber mats) that are not damaging to bicycle tires would be installed over the path to avoid damage from construction vehicles. In addition, trucks would cross the access to the southern portion of the Bayshore Bikeway where it intersects with Main Street. As outlined in MM-REC-1, signs would be installed to alert riders to the presence of protective materials on the path, and flaggers would be present to control trucks and bicycle traffic during active construction periods.

The implementation of Alternative B could also affect the Bayshore Bikeway by altering existing flood elevations and flood flow velocities downstream of I-5. In the existing condition, the Bayshore Bikeway begins to be flooded during the 10-year and 15-year storm event. With the implementation of Alternative B, the bike path would no longer be flooded during the 10-year storm event. Alternative B would not alleviate flooding of the bike path under the 100-year storm event, but it would prevent flooding of the bike path for smaller and more frequent flood events (Appendix H). More information is provided in Section 4.2.5.2, Tidal Flow Impacts, of this EIS.

To avoid potential impacts to users of the City's bike path that extends from Saturn Boulevard to Main Street in an area to the east of the Otay River Floodplain Site, this bike path would be rerouted during construction to avoid conflicts between bicyclists and construction vehicle ingress and egress from the Otay River Floodplain Site. The temporary bike path reroute, shown on Figure 2-1a, would direct users onto the existing Otay Valley Regional Park trail until the trail crosses the Otay River; then the trail would turn west and reconnect with the existing bike path. This reroute would include a paved pathway and signs for users during construction. MM-REC-2 is provided to offset any impacts associated with this reroute. Although public use may be temporarily affected on the Bayshore Bikeway and surrounding paths during construction, once restoration is complete, all public paths and public access to them would be completely restored to pre-project conditions.

Other recreational activities, such as boating and fishing within the open waters surrounding the project site, would not be affected under this alternative.

Implementation of Alternative B would result in construction-related impacts to surrounding public access facilities, including the Bayshore Bikeway and Saturn Boulevard bike path. Significant adverse impacts would be reduced through the incorporation of MM-REC-1 and MM-REC-2.

Mitigation Measures

The following mitigation measures are provided to avoid or minimize potentially significant impacts associated with conflicts between public access and construction activities occurring on the project site under Alternative B.

MM-REC-1 30 days prior to the start of any clearing and grubbing or mobilization(s), whichever occurs first, the contractor shall install warning and notification signs at the following locations: 1) along the Bayshore Bikeway in both directions and 50-feet away in both directions from the construction access point to the Pond 15 Site where vehicles will be crossing~~es~~ the Bayshore Bikeway and 2) at the Main Street/Frontage Road entrance to the Bayshore Bikeway in both directions and 50-feet away in both directions, as well as at the 13th Street entrance onto the east bound segment of the Bayshore Bikeway. The initial signs, to be posted 30 days prior to the start of construction, will alert riders of upcoming construction activity and the potential for future delays due to the presence of construction vehicles. Prior to initiating construction and installing protective materials on the bike path, the initial signs shall be replaced with warning signs informing riders to expect delays due to construction vehicles crossing the bikeway or entering Main Street from the project site, as applicable. Where protective materials will be installed on the bicycle path, the warning signs shall clearing alert riders to slow down due to the uneven surfaces that the protective materials will create. The contractor shall maintain all signs in good order throughout each of two construction periods. At the end of each construction period, the Bayshore Bikeway shall be returned to documented pre-project conditions. Prior to commencement of the second year of construction, the same signage procedures shall be followed as described above.

Similarly, at 50-feet away from the Main Street entrance (north end) and at and 50-feet away from the Saturn Boulevard entrance (south end) to the Saturn Boulevard bike path initial signs shall be installed 30 days prior to construction to alert riders about the upcoming construction and associated temporary reroute of the bike path, including a map indicating where the reroute will be located, and two weeks prior to construction, signs, with a map of the rerouted section, shall be installed to direct users onto and along the rerouted section of trail. In addition, warning signs shall be installed 50-feet away from Main Street along the reroute informing users of presence of construction vehicles entering and exiting Main Street and the potential for delays. The temporary reroute and all directional signs shall be maintained throughout the two-year construction period. Prior to commencement of the second year of construction, the same warning sign procedures shall be followed as described above. At the end of construction, the Saturn Boulevard bike path shall be returned to documented, pre-project conditions.

During active construction, flaggers shall be present to control trucks and bicycle traffic on the Bayshore Bikeway, with flaggers present at the Main Street/Frontage Road entrance to the Bayshore Bikeway, at the construction access point to the Pond 15 Site~~-~~, and at the northern extent of the rerouted Saturn Boulevard bike path. The contractor shall maintain the b~~B~~ikeway in good repair at all times, frequently remove any dirt or debris deposited on the bikeway or Main Street by trucks and construction equipment, and provide protective barriers as necessary.

~~Prior to any construction activity in the Bayshore Bikeway, the contractor shall install signs to alert riders to the presence of protective materials on the path and of potential intermittent closures during construction. During active construction, flaggers shall be present to control trucks and bicycle traffic on the Bayshore Bikeway, with flaggers present at the Main Street/Frontage Road entrance to the Bayshore Bikeway, as well as at the access point to the Pond 15 Site where the access point crosses the Bikeway. The contractor shall maintain the Bikeway in good repair at all times, provide protective barriers as necessary, and be responsible for restoring the Bikeway to pre-project conditions following completion of construction activities.~~

MM-REC-2 Prior to the commencement of project construction, a reroute of the Saturn Boulevard bike path shall be designed and required approvals obtained~~permitted~~, and prior to any other construction associated with the project, the contractor shall complete the approved temporary reroute of the bike path. Design, permitting, and construction shall be conducted in coordination with the City of San Diego Park and Recreation Department and the Streets Division, as well as ~~and~~ County of San Diego Park and Recreation Department. The project construction documents shall indicate that the contractor is responsible for restoring the existing bike path to documented preconstruction conditions following completion of all construction activities.

4.5.4.3 Alternative C

The potential impacts to public access, education, and recreational opportunities from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

MM-REC-1 and MM-REC-2 would also be implemented under Alternative C to avoid or minimize potentially significant impacts associated with construction activities occurring within the Bayshore Bikeway and Saturn Boulevard bike path.

4.5.5 Vectors and Odors

This section discusses the direct and indirect impacts with respect to vector breeding and odor generation of implementing the proposed action.

Significance Threshold: Impacts related to vectors and odor would be considered significant if the proposed action has the potential to substantially alter wetland conditions conducive to mosquito breeding or to substantially alter the potential for odors to be generated from within the project site.

4.5.5.1 Alternative A

Under this alternative, the Pond 15 Site would continue to generate potentially offensive odors due to decomposition of organic materials within shallow warm water. The mosquito composition and potential breeding habitat for the species in the Otay River and Nestor Creek discussed in Section 3.5.5, Vectors and Odors, of this EIS would remain unaltered. Alternative A would not result in substantial alteration of wetland conditions conducive to mosquito breeding or increase the potential for odors to be generated. No significant impacts are anticipated.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.5.2 Alternative B

Vectors

The majority of the mosquito populations and potential breeding habitat in the vicinity of the project includes fresh and brackish waters in Nestor Creek and the Otay River. Standing water could provide potential habitat for a variety of mosquito species found in the South Bay, in particular *Ochlerotatus taeniorhynchus* and *O. squamiger*. These species are not known to carry human diseases, but can be a nuisance during certain times of the year. The saltmarsh habitat that would be restored at the Otay Floodplain Site and Pond 15 Site under Alternative B would be inundated daily by the tides and has been designed to avoid the presence of standing water; therefore, the proposed restoration under Alternative B would not provide additional breeding habitat for mosquitos. Additionally, the wetlands would be graded so that no pooling water would be created above areas that are influenced by the tides.

The mosquito community in the San Diego Bay NWR would continue to be monitored under all alternatives by the San Diego County (County) Department of Environmental Health, and appropriate control actions would be considered by the San Diego Bay NWR if mosquito populations become a significant nuisance to adjacent residences. The County Department of Environmental Health, under a Special Use Permit issued by the Service (permit no. 81681-14003), would implement vector control measures on San Diego Bay NWR lands, including the application of larvicides or adulticides. Prior to such use of vector control measures, the County, as specified in the Special Use Permit, shall initiate coordination with the Service to avoid or minimize any potential adverse effects to San Diego Bay NWR lands. Additionally, as specified in the Special Use Permit, mosquito population control techniques during non-emergency conditions shall stress the use of biocontrol agents prior to the use of chemical larvicides or adulticides and shall dispense mosquito control compounds in accordance with U.S. Environmental Protection Agency regulations for each compound. County staff shall coordinate with San Diego Bay NWR staff on all actions taking place on NWR lands. Moreover, as specified in the Special Use Permit, at the beginning of each year’s migratory bird nesting season (prior to April 15), County field staff shall meet with San Diego Bay NWR biological and management staff to identify field protocols for avoidance and minimization of take to any trust resources, including listed species and their habitats and migratory birds (USFWS 2014).

Odors

Odors are a form of air pollution that is most obvious to the general public. Odors can present significant problems for both the source and surrounding community. Although offensive odors seldom cause physical harm, they can be annoying and cause concern.

Section 6318 of the San Diego County Zoning Ordinance requires that all commercial and industrial uses be operated so as not to emit matter causing unpleasant odors that are perceptible by the average person at or beyond any lot line of the lot containing said uses. Section 6318 goes on to further provide specific dilution standards that must be met “at or beyond any lot line of the lot containing the uses” (County of San Diego 1979). SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A proposed project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

Construction of Proposed Project would result in the emission of diesel fumes and other odors typically associated with construction activities. These compounds would be emitted in varying amounts on the site depending on where construction activities are occurring, number and types of construction activities occurring, and prevailing weather conditions, among other factors. A variety of sensitive receptors surround the general vicinity of the South San Diego Bay Unit of the San Diego Bay NWR, including the San Diego Bay NWR itself. These receptors include a mobile home park located to the south of the Otay River Floodplain within the City of San Diego, residential uses and an elementary school located along the south end of the San Diego Bay within the City of Imperial Beach, residential units scattered among small industrial uses to the east of Pond 15, and residential development located just to the west of the San Diego Bay NWR boundaries in the City of Coronado. However, all odor impacts would be temporary and would cease with completion of the project. Odors from construction activities would be localized in the immediate vicinity of the construction site and would be limited to a finite, temporary period of time. Therefore, impacts related to odors during construction would be less than significant.

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project would not include any of these operational activities typically associated with odors. Additionally, the proposed project would be required to comply with the County odor policies enforced by SDAPCD, including Rule 51 in the event a nuisance complaint occurs, and County Code Sections 63.401 and 63.402, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts to nearby receptors. Thus, the impacts associated with odors would be less than significant.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.5.3 Alternative C

The potential impacts to vectors and odors from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.6 Economics/Employment

This section discusses the direct and indirect economic impacts on the regional economy of implementing the proposed alternatives.

Significance Threshold: Impacts to the regional economy would be considered significant if the proposed action could substantially alter existing employment levels within the local or regional economy, set a precedent for future development trends in the project vicinity, or seriously interfere with daily operations on adjacent commercial and industrial properties.

4.5.6.1 Alternative A

Implementation of this alternative would have no benefits or significant adverse impacts on the economy or employment within the region. Alternative A would not substantially alter existing employment levels within the local or regional economy, set a precedent for future development trends in the project vicinity, or seriously interfere with daily operations on adjacent commercial and industrial properties.

Mitigation Measures

No significant adverse impacts related to economics or employment are anticipated; therefore, no mitigation measures are required.

4.5.6.2 Alternative B

Under this alternative, the Otay River Floodplain Site, as a portion of the San Diego Bay NWR, would continue to lack direct employment opportunities and would not make a notable contribution to the regional economy, due to lack of entrance fees or public access to this portion of the San Diego Bay NWR.

The South Bay Salt Works, a commercial solar salt operation that encompasses the Pond 15 Site, would continue to operate without the use of Pond 15. The South Bay Salt Works is currently using Pond 15 as an evaporation pond. Construction operations associated with implementation of Alternative B have the potential to affect the operations at this facility. To offset any potential impacts, MM-ECO-1 has been identified to require coordination between the contractor and the adjacent facility.

Once construction is complete, restoration of the Pond 15 Site would remove this evaporation pond from the existing operation. However, as outlined in Section 3.5.6, Economics/ Employment, this operation makes minimal input into the local and regional economy. To minimize the impact of removing Pond 15 from the salt operation, the levees around the adjacent ponds would be reconfigured to eliminate any connection to Pond 15 and would be strengthened to avoid disruption of the overall system. Additionally, the programmatic EIS prepared for management of the San Diego Bay NWR that this EIS tiers from includes plans to restore each of the salt evaporation plans in this area to natural, tidally influenced habitat (USFWS 2006).

Alternative B includes restoration that would involve a total expenditure of between $15 and $24 million. Although this is a relatively minor amount of funding when viewed in terms of the regional economy, during construction this would result in direct expenditures that would be used to purchase materials and retain contractors. These expenditures would provide a minor benefit to the regional economy and employment. New opportunities for wildlife observation would have the potential to increase the number of visitors to the area, which could correlate with additional expenditures in retail trade, lodging, and food service. However, none of these impacts would be notable in terms of local or regional economy or employment. Therefore, with the implementation of MM-ECO-1, implementation of Alternative B would not substantially alter existing employment levels within the local or regional economy or seriously interfere with daily operations on adjacent commercial and industrial properties.

Mitigation Measures

The following mitigation measure has been incorporated to avoid or minimize potentially significant impacts associated with construction activities occurring in the vicinity of the South Bay Salt Works.

MM-ECO-1 To avoid conflicts with ongoing salt works operations, prior to the start of construction, the contractor shall provide the salt works management with an up-to-date construction schedule and timeline of activities related to the restoration project. The salt works management shall also receive monthly updates of construction progress and shall be informed immediately of any changes in the proposed schedule or timeline.

4.5.6.3 Alternative C

The potential for direct and indirect economic impacts on the regional economy from the implementation of Alternative C would be the same as described for Alternative B.

Mitigation Measures

MM-ECO-1 would also be implemented under Alternative C to avoid or minimize potentially significant impacts associated with construction activities occurring in the vicinity of the South Bay Salt Works.

4.5.7 Environmental Justice

This section evaluates the potential for adverse human health or environmental impacts on minority populations or low-income populations living in the vicinity of the project site as a result of implementing the various actions proposed in each alternative.

Significance Threshold: Impacts related to environmental justice would be considered significant if the proposed action would result in disproportionate human health impacts or environmental impacts to low-income or minority populations.

4.5.7.1 Alternative A

This alternative proposes continuing current management practices on the Otay River Floodplain Site, and solar salt production in the Pond 15 Site would not result in any disproportionate impact on human health or associated environmental impact. No significant impacts are anticipated.

Mitigation Measures

No significant adverse impacts related to environmental justice are anticipated; therefore, no mitigation measures are required.

4.5.7.2 Alternative B

Restoration of the project site under this alternative would have long-term benefits to biological resources. No significant and unavoidable impacts have been identified within this EIS. Although the median income within the general project vicinity is lower than the County average, and there is a larger racial minority population in this area, no significant adverse impacts are anticipated as a result of implementing Alternative B. Therefore, there would be no disproportionate adverse human health impacts or environmental impacts to any low-income or minority populations in the areas surrounding the project site.

Mitigation Measures

No significant adverse impacts related to environmental justice are anticipated; therefore, no mitigation measures are required.

4.5.7.3 Alternative C

The potential impacts to environmental justice from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.6 CUMULATIVE IMPACTS

Cumulative impacts can result from the incremental impacts of a project when added to other past, present, and reasonably foreseeable projects in the area. Cumulative impacts can result from individually minor but cumulatively significant actions over a period of time. This analysis is intended to consider the interaction of the proposed Otay River Estuary Restoration Project (ORERP or proposed action) with other actions occurring over a larger geographic area and time frame. The interrelated impacts of separate actions under the alternatives are also considered.

In order to provide a comprehensive list of projects that may result in cumulative impacts, the Port of San Diego (Port of San Diego; Port) and the cities of San Diego, Imperial Beach, Coronado, National City, and Chula Vista were all contacted to obtain information about past, present, and reasonably foreseeable projects within their jurisdiction.

4.6.1 Projects Considered in the Cumulative Impacts Analysis

Bayshore Bikeway

The Bayshore Bikeway is a 24-mile bicycle facility that would extend around the perimeter of the San Diego Bay when completed. Though much of the bikeway has been built, there are sections pending the Chula Vista Bayfront redevelopment along the eastern perimeter of the Bay north of the project site (SANDAG 2014).

Tijuana Estuary Tidal Restoration Program

The Tijuana Estuary Tidal Restoration Program would restore coastal wetlands in southern San Diego County, California, at the western end of the Tijuana River Valley. The project, which is the second phase of a larger restoration project, would produce a restoration plan for between approximately 250 to 300 acres in Friendship Marsh. When implemented, the Tijuana Estuary Tidal Restoration Program is expected to restore habitat values that have been lost and improve tidal exchange within the existing and future marsh. A secondary objective of this project is to identify options for protecting and enhancing the existing barrier beach. The project would attempt to address sand loss and the associated endangerment of critical habitats when high storm waves surge across the depleted dunes and into the salt marsh.

Chula Vista Bayfront Master Plan

In 2012 the Port of San Diego and the City of Chula Vista approved plans for the redevelopment of approximately 550 acres of land and water located along the eastern edge of the San Diego Bay between the Sweetwater Marsh Unit and the South San Diego Bay Unit. Plans within the 550 acres of waterfront include development of a broad range of urban uses, including high- and mid-rise residential development, commercial and office space, hotels, restaurants, major entertainment facilities, public open space, improvements to the existing harbor, and relocation of the existing boat channel in the south San Diego Bay (South Bay).

Implementation of the Chula Vista Bayfront Master Plan is anticipated to span approximately 30 years. Potential significant impacts identified in the environmental impact report for the Master Plan include impacts on land/water use compatibility, traffic and circulation, aesthetics/visual quality, hydrology/water quality, air quality, energy, noise, terrestrial biological resources, marine biological resources, paleontological resources, hazards and hazardous materials/public safety, public services, public utilities, and seismic/geologic hazards (Port 2008).

Multiple Species Conservation Planning

Preservation of the San Diego region's biological resources is being addressed through the implementation of regional habitat plans. In southwestern San Diego County, the Multiple Species Conservation Program (MSCP) would preserve a network of habitat and open space in an effort to conserve various species and protect the region's biodiversity. The MSCP is designed to preserve native vegetation and meet the habitat needs of multiple species, rather than focusing preservation efforts on one species at a time.

Several jurisdictions and various special districts are participating in the MSCP, including the cities of San Diego and Chula Vista and the County of San Diego (County). These jurisdictions have completed subarea plans that identify core biological resource areas targeted for conservation and describe specific mechanisms for implementing habitat preserves. To ensure the implementation of the subarea plans and the identified preserves, each jurisdiction has entered into an agreement with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife. Impacts to biological resources are managed through the various subarea plans. Compliance with the subarea plans, along with conformance to Federal and State regulations, is intended to reduce significant cumulative impacts to biological resources to below a level of significance.

The Otay River Floodplain Site and the Pond 15 Site, as well as adjacent properties, are located within the City of San Diego's (City's) Multi-Habitat Planning Area – Southern Area (City of San Diego 1997). The South San Diego Bay Unit and the Sweetwater Unit within the San Diego Bay National Wildlife Refuge (NWR) Complex represent the Federal government's contribution to the MSCP.

Naval Base Coronado Coastal Campus

The Naval Base Coronado Coastal Campus project involves consolidating Naval Special Warfare Command facilities to one location on Silver Strand Training Complex South. The project includes design and construction of logistical support buildings, equipment use and maintenance training facilities, classroom and tactical skills instruction buildings, storage and administrative facilities, utilities, fencing, roads, and parking. The U.S. Department of the Navy (Navy) prepared a Draft Environmental Impact Statement (EIS) for public review in July 2014. This document, which is currently in the process of being finalized based on public comments received, includes analysis of four potential alternatives: the Silver Strand Training Complex–South Bunker Demolition, the Silver Strand Training Complex–South Bunker Retention, the Multi-Installation Alternative, and the No Action Alternative.

Potential environmental impacts addressed in the EIS include land use, recreation, geology and soils, air quality, hazardous materials and waste, water quality and hydrology, noise, biological resources, cultural resources, traffic and circulation, socioeconomics and environmental justice, public health and safety, utilities and public services, coastal uses and resources, and aesthetics.

Otay River Watershed Management Plan and Special Area Management Plan

The County of San Diego, in cooperation with the Port of San Diego and the cities of Chula Vista and Imperial Beach, is currently developing a watershed management plan for the Otay River drainage. The plan involves characterizing the watershed’s various resources and land uses, identifying goals and objectives, and assessing and prioritizing threats to existing beneficial uses and natural resources. The plan would also provide a strategy to ensure high water quality standards and protect natural aquatic and upland resources in the watershed.

The County has also obtained Federal funds for the development of a Special Area Management Plan (SAMP) for the Otay River watershed. A SAMP is a comprehensive plan intended to provide for natural resource protection and reasonable economic growth in geographic areas of special sensitivity. This comprehensive planning effort is to be used to assist the Federal, State, and local regulatory agencies with their decision making and permitting authority to protect aquatic resources. Approval of these plans by the U.S. Army Corps of Engineers would result in the issuance of General Permits under the Clean Water Act for projects within the Otay River watershed. The SAMP would identify baseline conditions of the watershed, including water quality and the extent of wetlands, that can be used in other programs.

The SAMP could facilitate development within the watershed that has the potential to result in issues generally related to urbanization of natural areas, including changes in landform, visual quality, hydrology, and air quality; increases in traffic volumes; loss or degradation of native habitat; and impacts to cultural resources.

River Partners Otay River Delta Habitat Restoration Project

River Partners is a 501(c)(3) nonprofit public benefit corporation based in Chico, California, that specializes in restoration planning, riparian habitat restoration, monitoring and research, land acquisition, agriculture, education and outreach, and non-structural floodplain management. River Partners and the San Diego Bay NWR are restoring 55 acres of riparian habitat by replacing non-native vegetation with structurally diverse native plants to support a variety of neotropical migratory birds, including several listed species, as well as an array of other native wildlife. The project is located in the open space immediately east of the Otay River Floodplain Site.

Redevelopment of Pond 20A

Pond 20A, located immediately south of the Otay River Floodplain Site, is owned by the Port. The long-term plans for this area call for an 84-acre wetland mitigation bank in the center of the site; a 3.1-acre commercial area on the western edge of the site that is intended to complement Imperial Beach's Bikeway Village development; and a 7.9-acre area designated for low-intensity commercial development on the eastern edge of the site.

Port of San Diego Master Plan Update

The Port Master Plan is a document intended to provide the official planning policies, consistent with a general State-wide purpose, for the physical development of the tide and submerged lands conveyed and granted in trust to the San Diego Unified Port District. The update is anticipated to be complete in 2019 (Maher, pers. comm. 2015).

South Bay Wildlife Advisory Group Management Plan

The South Bay Wildlife Advisory Group was formed following a settlement agreement in May 2010 between the Port, the City of Chula Vista, and the Bayfront Coalition. The settlement agreement requires the Chula Vista Bayfront Master Plan to adopt environmental protections that go above and beyond those required by Federal, State, and local laws and regulations, including preparation of a Natural Resources Management Plan for the Chula Vista Bayfront. This is a plan to avoid impacts to natural resources based on the Chula Vista Bayfront.

Final Report for the Restoration and Enhancement Alternatives for the Chula Vista Bayfront

~~Merkel Contract to Identify Restoration Opportunities in South San Diego Bay~~

At a Board of Port Commissioners meeting on January 13, 2015, a resolution was authorized for an agreement between the Port and Merkel & Associates to identify alternatives for the enhancement and restoration of the Chula Vista Bayfront in an amount not to exceed $200,000 in compliance with the Chula Vista Bayfront Master Plan Settlement Agreement with the Bayfront Coalition. Merkel and Associates completed the Final Report for the Restoration and Enhancement Alternatives for the Chula Vista Bayfront in April 2017 (Merkel and Associates 2017). The final plan describes a range of restoration alternatives, identifies recommended alternatives, and identifies preliminary permitting and planning needs, engineering components, and capital and maintenance costs associated with alternatives. Implementation of this project is associated with the Chula Vista Bayfront Master Plan (Merkel and Associates 2017).

~~Restoration and enhancement options are being discussed for connecting J Street Marsh and the adjacent uplands; naturalizing J Street Channel and Telegraph Creek; accommodating anticipated sea-level rise with recommendations for soft or natural infrastructure; providing habitat connectivity; conducting a hydraulic analysis of water movement in South Bay; and enhancing mudflats, eelgrass, and existing salt marshes in the area (Port 2014). Implementation of this project is associated with the Chula Vista Bayfront Master Plan (Maher, pers. comm. 2015).~~

San Diego Bay Integrated Natural Resources Management Plan

This plan, which was sponsored by the Navy and the Port, presents a long-term management strategy for the San Diego Bay. Approved in September 2013, the document was intended to provide direction for stewardship of the Bay's natural resources, while also supporting the ability of the Navy and Port to meet their missions and continue operating within the Bay. The plan's goal is to "Ensure the long-term health, recovery, and protection of San Diego Bay's ecosystem in concert with the Bay's economic, Naval, recreational, navigational, and fisheries needs." The core strategies of the plan include managing and restoring habitats, populations, and ecosystem processes; planning and coordinating projects and activities so they are compatible with natural resources; improving information sharing, coordination, and dissemination; conducting research and long-term monitoring that supports decision making; and creating a stakeholders' committee to ensure collaborative, ecosystem-based problem-solving. The plan contains over 1,000 strategies for achieving better management of the Bay, including the protection, enhancement, and restoration of the Bay's coastal habitats. An important objective of the plan is to improve the effectiveness and success of mitigation and enhancement projects by building a consensus of prioritized need among regulators and project proponents (Port 2013).

South Bay Substation Relocation Project

This project included the relocation of the existing South Bay Substation in the City of Chula Vista. The existing substation was relocated approximately 0.5 miles south, to the new Bay Boulevard Substation site, which is approximately 2 miles south of the City of National City, approximately 5 miles northeast of the City of Imperial Beach, and approximately 7 miles southeast of downtown San Diego. The ~~existing~~ new Bay Boulevard Substation replaced ~~station,~~ an aging 138/69 kilovolt (kV) substation, ~~is~~ that was undersized for current transmission system conditions. The updated line included a bulk replacement power source to connect to the 230 kV transmission lines in the area, including the Otay Metro Power Loop. A Final Environmental Impact Report for the project was published on April 26, 2013. The ~~project~~ Bay Boulevard

Substation was energized in June 2016. ~~is currently under construction, with an anticipated completion date of July 2017 (CPUC 2015).~~

Charles Company Proposed Development of the Magnesium Chloride Salt Ponds

The Charles Company proposed a "concurrent and integrated development" of the Salt Bay Commerce Center and Pond 20 lands, in partnership with the Port of San Diego (Charles Company 2012). Along with the proposed Salt Bay Commerce Center, the Charles Company also identified a variety of development and wetland restoration features on the Port's Pond 20 property (Charles Company 2012). ~~This restoration project includes an extension of the Bayshore Bikeway from 13th Street along the periphery of Pond 20 with an upland buffer parallel to Palm Avenue and through the City's Otay Valley Regional Park. The intent is to increase bicycle and pedestrian traffic in the area and improve connectivity of the Bayshore Bikeway with bicycling staging areas at the terminus of 19th Street. The project also includes a 1.0-acre visitor-oriented commercial area including bike services, bike rentals, coffee and refreshments, and a potential restaurant overlooking the wetland restoration area (Charles Company 2012). Implementation of this project is not anticipated to begin construction until 2025 (Maher, pers. comm. 2015).~~

4.6.2 Cumulative Impacts Analysis

4.6.2.1 Cumulative Impacts to the Physical Environment

Topography/Visual Quality

Cumulative impacts to topography and visual quality include modifications to the existing landform from this and other past, present, and reasonably foreseeable actions; if the combined actions would be reasonably expected to substantially alter the overall appearance of the southeastern perimeter of San Diego Bay, the cumulative impact would be considered significant.

The majority of the projects included in the cumulative impacts analysis involve proposals that would alter the existing topography and visual appearance of the area. As discussed in Section 4.2.1, Topography/Visual Quality, implementation of Alternative B (the preferred alternative) and Alternative C would temporarily affect the aesthetic views of the site during construction and in the long term would have beneficial impacts on the visual quality of the project site and the Bay. Potentially significant impacts to visual quality were identified as discussed in Section 4.2; however, with implementation of MM-VIS-1, all impacts would be reduced to a level that is less than significant. As such, the project under either Alternative B or Alternative C would not contribute to a significant adverse impact to the local topography or visual quality. Although some of the projects identified in the general vicinity of the project may alter the appearance of the southeastern perimeter of San Diego Bay, the proposed action would not represent a cumulatively considerable portion of this potential cumulative impact for the reasons identified above. No significant cumulative impacts are anticipated.

Geology, Soils, and Agricultural Resources

Under either action alternative, through implementation of mitigation measures proposed, the ORERP would not trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion affecting on-site facilities, such as levees, or adjacent facilities, such as roadway and railway embankments and bridge abutments and pilings. Several projects included in the cumulative study area would potentially contribute to soil erosion during construction. However, the mitigation measures provided to reduce these impacts would ensure that no cumulative impacts to geology or soils would occur.

Impacts to agricultural resources would be considered cumulatively significant if the proposed action in combination with other past, present, and reasonably foreseeable actions would result in the conversion of a substantial area of land identified by the State as Farmland of Local Importance to non-agricultural uses. Restoration of the project site under either Alternative B or Alternative C would not result in significant impacts to these designated lands. Several of the parcels in the surrounding area are currently designated as Farmland of Statewide or Local Importance, but none are designated as Prime Farmland on the California Department of Conservation's San Diego County Important Farmlands 2010 Map (CDOC 2013). Potentially significant impacts were identified due to potential erosion; however, with implementation of MM-GEO-1and MM-GEO-2, all impacts would be reduced to a less than significant level. Additionally, no active agricultural operations are located in this area, and it has not been an active agricultural area for more than 20 years. Because the proposed action would not result in the conversion of land identified as Prime Farmland or Farmland of Statewide Importance to non-agricultural use, implementation of either Alternative B or Alternative C would not contribute to a significant cumulative impact on agricultural resources.

Mineral Resources

The project site is classified by the City as a Mineral Resource Zone 1, which is an area where no significant mineral deposits are present or where it is judged that there is little likelihood for their presence (City of San Diego 2008). There are no mineral resource zones with high likelihood of mineral and gemstone resources. Therefore, implementation of either Alternative B or Alternative C would not contribute to a significant cumulative adverse impact on mineral resources.

Paleontological Resources

Mitigation measure MM-PALEO-1 has been provided to ensure that the proposed action would not directly or indirectly damage a unique paleontological resource or site, or disturb resources in a paleontologically sensitive area. Although there may be a potentially significant impact to paleontological resources at the project-level, implementation of either Alternative B or Alternative C would not represent a cumulatively considerable portion of a potential impact.

Hydrology and Water Quality

Cumulative impacts related to fluvial or tidal hydraulics would be considered significant if the proposed action, in combination with other projects in the vicinity, would increase the currently projected 100-year flood elevations upstream or downstream of the project site or could increase flood flow or tidal velocities resulting in measurable scour or erosion upstream or downstream of the project site. Cumulative water quality impacts would be considered significant if the proposed action, in combination with other projects in the vicinity, would result in violations of water quality standards or waste discharge requirements, substantial increase of downstream sedimentation, or introduction of contaminants (non-point source pollution) into the watershed.

Several projects included in the cumulative impacts analysis would alter the existing flood characteristics within the Otay River floodplain. As natural areas are converted to urban development, the acreage of impervious surfaces increases, which in turn increases the volume and velocity of urban runoff and decreases water quality. During construction, there is a potential for significant impacts, but these impacts would be avoided or minimized through the implementation of best management practices (BMPs) and mitigation measures proposed in Section 4.2.5, Hydrology and Water Quality. Potentially significant impacts to hydrology and water quality were identified as discussed in Section 4.2; however, with implementation of MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 all impacts would be reduced to a less than significant level. Following completion of the restoration, the restored wetlands would contribute beneficial impacts to regional water quality. As discussed in Section 4.2.2, Geology, Soils, and Agricultural Resources, analysis conducted for the project under both Alternative B and Alternative C indicates that with the incorporation of specific mitigation measures into the scope of the proposed action, the proposed changes associated with wetlands restoration would avoid exacerbating known flooding issues downstream of the project site or increasing potential impacts associated with scouring or erosion.

Additionally, with avoidance of excavation activities in areas with contaminated soils and the placement of an Exposure Reduction Cover over soils on the eastern portion of the Otay River Floodplain Site east of Nestor Creek, where high concentrations of DDTs have been identified ~~and in the vicinity of the project site in the Otay River floodplain~~, significant impacts are not anticipated with either action alternative. With similar site-specific soils analysis and avoidance measures implemented for additional projects in the area, the proposed action would not result in a cumulative impact with respect to hydrology or water quality. Therefore, the proposed action under either Alternative B or Alternative C would not contribute to a cumulatively significant impact related to hydrology or water quality.

Air Quality

Cumulative air quality impacts are generally analyzed based on consistency with the local air quality plan for the basin in which the proposed action is located. For the San Diego Air Basin (SDAB), the Regional Air Quality Strategy (RAQS) serves as the long-term regional air quality planning document for the purpose of assessing cumulative emissions in the basin to ensure the SDAB continues to make progress toward National Ambient Air Quality Standards and California Ambient Air Quality Standards attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents on which the RAQS is based would have the potential to result in cumulative operational impacts if they represent development and population increases beyond regional projections.

The SDAB has been designated as a Federal nonattainment area for ozone (O_3) and a State nonattainment area for O_3, coarse particulate matter (particulate matter less than or equal to 10 microns in diameter; PM_{10}, and fine particulate matter (particulate matter less than or equal to 2.5 microns in diameter; $PM_{2.5}$). PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the basin. The emissions of all criteria pollutants for the proposed action would be below the "de minimis" thresholds, as analyzed in Section 4.2.6, Air Quality. Construction under the proposed action would be short term and temporary in nature. It is possible that other projects could be constructed in the same general time frame as the proposed action; however, analysis of cumulative emissions of volatile organic compounds (VOCs), carbon monoxide (CO), and sulfur oxides (SO_x) in terms of construction emission concentrations of these pollutants would be speculative due to variability in project construction schedules and mobile source trip routes. Additionally, background concentrations of these pollutants are typically very low relative to the California Ambient Air Quality Standards and National Ambient Air Quality Standards in the project site area because this area is not characterized by substantial urban activity that would otherwise result in higher ambient pollution concentrations. Regarding PM_{10}, $PM_{2.5}$, and NO_x, cumulative emissions of these pollutants would be temporary; would be primarily localized to the project site, particularly during site preparation and grading activities; and would not be emitted over long distances. During construction, each of the cumulative projects identified previously would be required to comply with San Diego Air Pollution Control District and California Air Resources Board rules regulating air quality. Moreover, as described in Section 4.5.2, Traffic, Circulation, and Parking, the proposed action's contribution to on-road passenger vehicle and road travel would not be substantial. Once construction is completed, construction-related emissions would cease. Therefore, the proposed action's minimal on-site and mobile emissions, when added to other projects in the vicinity, would not result in a cumulatively significant impact.

Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the State Implementation Plan and RAQS serve as the primary air quality planning documents for the State and SDAB, respectively. The State Implementation Plan and RAQS rely on San Diego Association of Governments growth projections based on population, vehicle trends, and land use plans developed by the cities and the County as part of the development of their general plans. Therefore, projects that involve development that is consistent with the growth anticipated by local plans would be consistent with the State Implementation Plan and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. As a restoration project, the proposed action would not result in the generation of substantial vehicle trips or other operational-related air emissions that would contribute to a cumulative air quality impact, and thus would not result in significant regional growth that is not accounted for within the RAQS. As a result, the proposed action would not result in a cumulatively considerable contribution to regional criteria pollutant concentrations. Cumulative impacts would be less than significant.

Noise

Cumulative noise impacts would be considered significant if the incremental increases in noise generated during construction, along with noise from other existing or anticipated actions in the area, would exceed accepted noise standards for any sensitive receptors. Construction of the proposed restored wetlands under Alternatives B and C would cause a temporary increase in noise associated with the necessary operation of equipment and vehicles~~.~~. Potentially significant impacts to noise were identified as discussed in Section 4.2; however, with implementation of MM-NOI-1, all impacts would be reduced to a less than significant level. Once construction is complete, the ORERP under either action alternative would not result in an increase in ambient noise levels. Therefore, implementation of either Alternative B or Alternative C would not contribute to any permanent significant cumulative noise impacts.

Climate Change/Sea-Level Rise

Although the habitat types proposed under both Alternative B and Alternative C would be altered under the 2050 sea-level rise scenario, neither action alternative would exacerbate the impacts of sea-level rise on adjacent development or native habitat. Further, the restored coastal wetlands would provide benefits related to climate change as a result of the amount of carbon that these wetlands would sequester over time. Overall, the implementation of either Alternative B or Alternative C would not result in significant cumulative adverse or beneficial impacts related to climate change or sea-level rise.

Greenhouse Gases

Due to the nature of assessment of greenhouse gas emissions and the impacts of global climate change, impacts can currently only be analyzed from a cumulative context; therefore, the analysis provided in Section 4.2.9, Greenhouse Gases, includes the analysis of both the proposed action and cumulative impacts. As outlined in detail in that section, the proposed action would not result in cumulatively significant greenhouse gas emissions.

Contaminants

As outlined in detail in Section 3.2.10, Contaminants, of this EIS, with avoidance of any excavation of contaminated soils east of Nestor Creek within the Otay River Floodplain Site, and within the general vicinity of both project sites, significant impacts are not anticipated with either action alternative. Potential impacts associated with implementation of various projects in the general vicinity of the site would not increase with the addition of the ORERP. Therefore, implementation of either Alternative B or Alternative C along with other projects identified within the cumulative study area would not result in a significant contribution to a cumulative impact associated with contaminants.

4.6.2.2 Cumulative Impacts to Biological Resources

Many of the projects being considered for implementation in the vicinity of the wetland restoration sites could result in disturbance to wildlife. Some of the uses proposed within the vicinity could also result in disturbance to wildlife if appropriate controls, such as seasonal restrictions, are not imposed. With the implementation of MM-BIO-1 through MM-BIO-12 ~~11~~ outlined in Section 4.3, Biological Resources, the only permanent impacts from Alternative B (preferred alternative) and Alternative C would be beneficial impacts to habitat and vegetation, wildlife and fisheries, and endangered species. Therefore, even with potential impacts associated with the cumulative projects list, the proposed action would not result in a significant cumulative impact to biological resources.

Although the wetlands on the project site would be temporarily affected during construction under both Alternative B and Alternative C, these impacts would be more than offset by the ultimate restoration efforts under the proposed action. Therefore, implementation of either Alternative B or Alternative C would result in a net gain of wetland habitat within the San Diego Bay. This net gain in wetland habitat would be considered part of a cumulative net gain when considered with the other wetland restoration projects described above. See Section 4.3.1, Impacts on Habitat and Vegetation Communities, Including Jurisdictional Wetlands and Waters, for a discussion of impacts associated with conversion of non-wetland habitat and salt pond areas to tidal wetlands.

4.6.2.3 Cumulative Impacts to Cultural Resources

Cumulative significant impacts to cultural resources would occur if the proposed action combined with other past, present, and reasonably foreseeable actions resulted in changes to a cultural resource listed in or eligible for listing in the National Register of Historic Places, its landscape, or its setting that collectively could result in a loss of integrity. With adherence to MM-CUL-1 through MM-CUL-5 described in Section 4.4, Cultural Resources, of this EIS, no significant adverse cultural resources impacts are anticipated with implementation of either Alternative B or Alternative C. With similar mitigation measures implemented for the Otay River Floodplain Site, the Pond 15 Site, and associated project features under both alternatives, and due to the nature of impacts to cultural resources, the proposed action would not contribute to a cumulatively significant impact to cultural resources.

4.6.2.4 Cumulative Impacts to the Social and Economic Environment

Land Use

Cumulative impacts would be considered significant if the incremental direct or indirect impacts of the proposed action, when added to other related actions, would substantially alter the use or intensity of uses within the area. As discussed in Section 4.5.1, Land Use, the proposed wetland restoration as described under Alternative B and Alternative C would be consistent with all applicable planning documents and would not result in adverse land use impacts. Therefore, the implementation of either Alternative B or Alternative C is not anticipated to contribute to a cumulatively significant impact with regard to land use.

Traffic, Circulation, and Parking

Cumulative traffic impacts would be considered significant if traffic generated by the proposed action, combined with other past, present, and reasonably foreseeable actions, would result in substantial changes to current traffic volumes, congestion at major intersections, or changes in current roadway conditions. As discussed in Section 4.5.2, Traffic, Circulation, and Parking, once construction is complete, the restored wetlands under either Alternative B or Alternative C would create a minimal increase in traffic trips to the San Diego Bay NWR over the existing condition. Because minimal permanent trips would be added to area roadways, the proposed action would have no adverse or beneficial cumulative impact on the local or regional transportation system.

During construction under Alternative B or Alternative C, the total trips on area roadways would increase, particularly if material is transported from the Otay River Floodplain Site to the Pond 15 Site via the truck transport method. All affected roadways are currently operating below their design capacity. Through implementation of MM-TRA-1 and MM-TRA-2, all potential significant impacts would be reduced to less than significant during construction. There are currently no additional projects scheduled for construction in the immediate vicinity. The implementation of the Chula Vista Bayfront Master Plan is underway, but these projects are in the initial planning stages, and no timeline for construction has been identified. Thus, the construction schedules for other projects in the general vicinity are not likely to overlap with the construction timeline for the proposed action. As a result, implementation of either Alternative B or Alternative C is not anticipated to result in cumulatively significant adverse traffic impacts.

Public Utilities/Easements

Cumulative impacts would be considered significant if the proposed action would have the potential to incrementally affect public utilities and easements in the general vicinity of the proposed action. Construction access to the Otay River Floodplain Site would require the creation of a temporary construction access road that would likely travel along a portion of the existing bike path east of the site boundary. Through standard construction design, inclusion of the exact locations of all utility lines on final construction documents, and implementation of MM-UTL-1, no damage or significant impact to utilities, utility service, or utility easements would result from the implementation of the action alternatives. Due to the nature of public utility and easement impacts, project impacts are mostly site specific. As noted under Traffic, Circulation, and Parking, there are currently no additional projects scheduled for construction that are in the immediate vicinity or that would impact the same utilities and easements. Therefore, no significant cumulative impacts are anticipated.

Public Access and Recreational Opportunities

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter public access and/or recreational opportunities. Depending on the method of soil transport between the two non-contiguous portions of the project site, the Bayshore Bikeway and the bike path east of the Otay River Floodplain Site may have intermittent interruptions of access, but the bikeway would remain open during all construction activities. Although construction may affect access to both the Bayshore Bikeway and the path east of the Otay River Floodplain Site, these impacts would be temporary and mitigated through measures outlined in MM-REC-1 and MM-REC-2, including the use of a flagger to moderate recreational traffic in these areas during construction. In addition, as outlined under Traffic, Circulation, and Parking, there are currently no additional projects scheduled for construction in the immediate vicinity. Therefore, no temporary cumulative impacts are anticipated. Similarly to the proposed action, the projects within the cumulative study area would not permanently affect recreational facilities, and some would continue to beneficially enhance recreational facilities in the area. Therefore, cumulative impacts on public access and recreational opportunities in the area would be less than significant.

Vectors and Odors

Vectors

Cumulative impacts would be considered significant if the impacts of the proposed action combined with other past, present, and reasonably foreseeable future actions would substantially alter conditions that support mosquito breeding. Both action alternatives take into account the potential for vector production, and implementation of either Alternative B or Alternative C would ensure that the site would drain to avoid ponded water areas where mosquito breeding may increase. Additionally, although Alternative C would not drain the site completely, the proposed action under both alternatives would be designed to allow for continual tidal flow, turbidity, and non-stagnant hydrology such that conditions suitable for mosquito breeding would not readily occur. Moreover, the County Department of Environmental Health protects public health and safeguards environmental quality by regulating mosquito production and preventing associated diseases carried by mosquitoes. With compliance with County Department of Environmental Health regulations, implementation of Alternative B or Alternative C along with other projects identified within the cumulative study area would not result in a significant contribution to a cumulative impact associated with vector management.

Odors

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter conditions to increase odor generation. As described in Section 4.5.5, Vectors and Odors, the Otay River Floodplain Site would be graded to ensure that it would be inundated at high tide, with no pooling water during low tide. Additionally, the proposed action would increase tidal influence and water circulation in the area, which would reduce the likelihood of objectionable odors in the area. Grading during construction could expose decomposed materials, resulting in temporary objectionable odors. However, these odors would be alleviated through tidal circulation after the completion of construction. Area restoration projects in the cumulative project area would similarly decrease odors, with temporary impacts associated with grading and exposure of decomposed materials. As outlined under Traffic, Circulation, and Parking, there are currently no additional projects scheduled for construction in the immediate vicinity concurrent with the ORERP timeline. Therefore, no temporary cumulative impacts are anticipated, and the proposed action is not anticipated to contribute to cumulatively considerable effects from odors.

Economics/Employment

Cumulative impacts would be considered significant if the proposed action resulted in the incremental direct or indirect impacts on economic and employment opportunities. Both action alternatives would create temporary construction jobs. The restoration projects and other development projects outlined above would either benefit area economics or create job opportunities. With the implementation of MM-ECO-1, all potentially significant impacts to the salt works operation would be minimized. Therefore, the proposed action would not cumulatively contribute to a significant adverse or beneficial impact related to economics or employment.

Environmental Justice

Cumulative environmental impacts would be considered significant if the proposed action would result in incremental direct or indirect impacts to undiversified communities. No significant impacts are anticipated as a result of implementation of Alternative B or Alternative C that would result in disproportionate adverse human health impacts or environmental impacts to any low-income or minority populations in the areas surrounding the project site. Similarly, the cumulatively considered projects in the area are not anticipated to disproportionately affect low-income or minority communities. Therefore, no cumulatively considerable impacts to low-income or minority communities would be anticipated.

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CHAPTER 5
COMPARISON OF EVALUATED ALTERNATIVES

The three alternatives for the Otay River Estuary Restoration Project (ORERP or proposed action) are outlined in detail in Chapter 2 of this environmental impact statement (EIS). Alternative A, the no action alternative, would not create any significant impacts through implementation. Both action alternatives, Alternative B and Alternative C, would create similar impacts on the environment, such as temporary recreational trail interruption. Although both action alternatives would create temporary significant impacts during construction, both would create beneficial significant impacts to biological resources upon implementation, and would minimize existing flooding hazards. The two action alternatives differ in their significant beneficial biological impacts; Alternative B is the preferred alternative, as outlined in detail in Section 4.2, Physical Environment.

A summary of the potential beneficial and significant impacts associated with implementation of each alternative for each resource area identified in this document is outlined in Table 5-1. To minimize or avoid significant impacts associated with the implementation of Alternative B or C, mitigation measures have been identified for each proposed project alternative as described in detail in Chapter 4, Environmental Consequences.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
Physical Environment			
Topography/Visual Quality	No change from the existing condition.	Under this alternative, grading techniques to achieve varying elevations would mimic the natural topography in the area, which is low-lying with gradual slopes. Alternative B would not result in the substantial alteration of locally or regionally important topographic landforms, or block public views to a scenic resource (such as San Diego Bay) from existing public vantage points. Impacts would be less than significant.	Impacts would be similar to those identified for Alternative B.
Geology, Soils, and Agricultural Resources	No change from the existing condition.	With implementation of mitigation measures to offset any potential impacts, this alternative would not trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion that would affect on-site or adjacent facilities. This alternative would not create significant impacts to potential farmlands.	Impacts would be similar to those identified for Alternative B.
Mineral Resources	No change from the existing condition.	This alternative would not result in the loss of the availability of a known mineral resource that would be of value to the region, and does not propose incompatible uses on or within the vicinity (generally up to 1,300 feet) of an area classified as MRZ-2, on land classified as MRZ-3, on land underlain by Quaternary alluvium, or on or within the vicinity of areas known to contain industrial material or gemstone resources.	Impacts would be similar to those identified for Alternative B.
Paleontological Resources	No change from the existing condition.	With implementation of MM-PALEO-1, this alternative would not directly or indirectly damage a unique paleontological resource or site, or propose grading or excavation that would disturb the substratum or parent material below the major soil horizon in a paleontologically sensitive area.	Impacts would be similar to those identified for Alternative B.
Hydrology/Water Quality	No change from the existing condition. Flooding of adjacent and downstream areas, including residential properties, is possible during storm events.	In general, Alternative B would not change flood elevations in tidally influenced areas, including the western portion of South Bay Salt Works area (formerly Ponds 10A, 10, and 11). Flooding would increase for Ponds 12, 13, 14, 28, and 29. In addition, implementation of Alternative B would alter the maximum 100-year flood elevation along the Bayshore Bikeway~~bike path~~, as shown on Figure 4.2-2. With implementation of this alternative, flooding along the bike path would not occur up to the 15-year return period flood event. In general, the 100-year flood elevations would decrease at the center portion of the bike path along Pond 20, but increase at	Impacts would be similar to those identified for Alternative B.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
		the southern end of the bike path along Pond 22. The higher flood elevations would be due to the redistribution of the flood flows. The residential area in Imperial Beach near Bayside Park is currently at risk for flooding in the existing condition. With implementation of project features such as the levee between Ponds 22 and 23 and the berm along the southern perimeter of the Otay River Floodplain Site, Alternative B would not result in any increase in flood elevations expected at this location under existing conditions. During dry-weather conditions under Alternative B, both the Otay River Floodplain Site and the Pond 15 Site would be in a steady-state equilibrium that is neither depositional nor erosional. Source-water inlets to both portions of the project site are stable and immune to closure or restriction by sedimentation under dry-weather tidal exchange. Excavation and filling associated with the implementation of Alternative B, as well as the long-term presence of these restored wetlands, would not result in any violation of water quality standards or waste discharge requirements (with the possible requirement of a construction dewatering permit), substantially increase downstream sedimentation, or otherwise substantially degrade water quality in either dry-weather or wet-weather conditions. Although contaminants from soils in the eastern portion of the Otay River Floodplain Site may erode under an extreme flood event and be suspended into floodwaters, the downstream effects would not result in significant adverse effects to water quality or biological resources. An Exposure Reduction Cover would be placed over the area east of Nestor Creek that contains elevated levels of contaminants, primarily DDT. The ERC, which would be between 1 foot to 1.5 feet in thickness, approximately 23.11 acres in area, and revegetated with appropriate native upland vegetation, would further reduce the potential for adverse effects. ~~implementation of this alternative would not introduce any additional contaminants.~~ Therefore, no significant impacts are anticipated.	

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
Air Quality	No change from the existing condition.	Construction of this alternative would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials and soil from the Otay River Floodplain Site to the Pond 15 Site. The implementation of MM-HYD-4 would minimize the potential for impacts related to fugitive dust. Daily construction emissions would not exceed the thresholds for volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide (CO), sulfur oxides (SOx), or particulate matter (PM10 and PM2.5). Additionally, criteria pollutant emissions would not exceed the annual General Conformity de minimis thresholds. Impacts would not be significant.	An additional 54,000 cubic yards of soil would be transported from the Otay River Floodplain Site to the Pond 15 Site, resulting in additional truck trips under the truck soil transport option. Even with these additional trips, daily construction emissions would not exceed the thresholds for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$. Additionally, criteria pollutant emissions would not exceed the annual General Conformity de minimis thresholds. Impacts would not be significant.
Noise	No change from the existing condition.	Construction of this alternative would result in a temporary increase in ambient noise levels on the project site on an intermittent basis. Due to the ~~lack of sensitive receptors within 50 feet of the site,~~ discontinuation of work during the nesting season, restricting construction activities to the hours between the hours of 7 a.m. and 7 p.m. Monday through Saturday and not permitting any activities on Sundays, and the dispersed construction area, construction noise levels are not expected to significantly impact wildlife or residential uses along the truck route. The project would ~~are anticipated to~~ comply with the applicable noise criteria of surrounding jurisdictions. Once construction is complete, under this alternative, the proposed action would not result in a permanent increase in ambient noise levels.	Impacts would be similar to those identified for Alternative B.
Climate Change and Sea-Level Rise	No change from the existing condition.	The effects of ~~Potential~~ sea-level rise were ~~was~~ included in the design of the habitat types at both the Otay River Floodplain Site and the Pond 15 Site under this alternative. ~~Mudflat and low marsh habitat would significantly increase, but~~ M~~m~~id-marsh and high vegetated marsh habitat would be converted to intertidal mudflat and low marsh habitat as sea levels rise~~almost completely lost~~.	Impacts would be similar to those identified for Alternative B.
Greenhouse Gases	No change from the existing condition.	The threshold of 10,000 metric tons of carbon dioxide equivalent (MT CO_2E) per year was used to assess the impact of the proposed action's greenhouse gas (GHG) emissions. The highest total construction	Impacts would be similar to those identified for Alternative B.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
		emissions under the proposed action in any one year for any of the proposed construction options would equal approximately ~~1,411~~3,518 MT CO_2E per year under the ~~slurry pipeline~~conveyor belt method of material transfer. Therefore, the maximum annual construction-related GHG emissions would be below the GHG emissions threshold of 10,000 MT CO_2E per year.	
Contaminants	No change from the existing condition.	With avoidance of any excavation in contaminated soils on the portion of the Otay River Floodplain Site east of Nestor Creek through project design, significant impacts are not anticipated.	Impacts would be similar to those identified for Alternative B.
Biological Resources			
Habitat and Vegetation	No change from the existing condition.	Under this alternative, the proposed restoration activities at the Otay River Floodplain Site would result in direct temporary and permanent construction-related impacts to vegetation communities. Approximately 33.51 acres of vegetation communities would be affected within the Otay River Floodplain Site, as itemized in Table 4.3-3. The proposed restoration activities at the Pond 15 Site would result in direct temporary and permanent construction-related impacts to 90.90 acres of vegetation communities, as itemized in Table 4.3-4. Implementation of the other project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would result in direct temporary and permanent construction-related impacts to 36.44 ~~approximately 40.90~~ acres of vegetation communities and land covers, as itemized in Table 4.3-5. A mix of native wetland coastal salt marsh plant species would be planted at both sites to create low, mid, and high salt marsh vegetation communities with lesser amounts of frequently flooded and frequently exposed mudflat. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 ~~2018~~ is provided in Table 4.3-1. A total of 115.83 ~~118.49~~ acres of wetlands, 0.96 acre of high tide refugia, and 7.62 ~~5.92~~ acres of upland ~~transitional or berm~~ will be provided per Table 4.3-1. Alternative B is focused on restoration of intertidal habitat including more salt marsh habitat and less subtidal.	Under this alternative, the proposed restoration activities at the Otay River Floodplain Site would result in similar impacts to vegetation communities as Alternative B, as itemized in Table 4.3-12. The proposed restoration activities at the Pond 15 Site would result in impacts to vegetation communities similar to those under Alternative B, as itemized in Table 4.3-13. Implementation of the other project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would be the same as those identified for Alternative B. A mix of native wetland coastal salt marsh plant species would be planted at both sites to create subtidal, low, mid, and high salt marsh vegetation communities, with lesser amounts of frequently flooded and frequently exposed mudflat. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 ~~2018~~ is provided in Table 4.3-10. Alternative C is focused on restoration of subtidal habitat with less restoration of intertidal salt marsh

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
			habitat.
Jurisdictional Waters	No change from the existing condition.	Under this alternative, the proposed restoration activities at the Otay River Floodplain Site would result in direct temporary and permanent construction-related impacts to jurisdictional waters associated with the Otay River channel. Approximately 6.43 acres of U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board (Regional Board), and/or California Coastal Commission jurisdictional wetlands would be affected within the 33.51-acre Otay River Floodplain Site as itemized in Table 4.3-6. The proposed restoration activities at the Pond 15 Site would result in direct temporary and permanent construction-related impacts to 88.14 acres of Corps/Regional Board/ California Coastal Commission jurisdictional wetlands as itemized in Table 4.3-7. Implementation of the other project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would result in direct temporary and permanent construction-related impacts to approximately 4.51 ~~3.16~~ acres of jurisdictional waters. The restoration would create low, mid, and high salt marsh vegetation communities with lesser amounts of frequently flooded and frequently exposed mudflat. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 ~~2018~~ is provided in Table 4.3-1. A total of 115.83 ~~118.49~~ acres of wetlands, 0.96 acre of high tide refugia, and 7.62 ~~5.92~~ acres of upland ~~transitional habitat or berm~~ will be provided per Table 4.3-1. The Otay River Floodplain Site would be restored to coastal salt marsh wetlands, and the Pond 15 Site would be restored to tidally influenced subtidal and intertidal wetlands with a focus on intertidal restoration.	Under this alternative, the proposed restoration activities at the Otay River Floodplain Site would result in similar impacts to jurisdictional waters as Alternative B as itemized in Table 4.3-14. The proposed restoration activities at the Pond 15 Site would result in impacts to jurisdictional waters similar to those under Alternative B, as itemized in Table 4.3-15. Implementation of the other project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would be the same as those identified for Alternative B. The restoration would create subtidal, low, mid, and high salt marsh vegetation communities, with lesser amounts of frequently flooded and frequently exposed mudflat. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 ~~2018~~ is provided in Table 4.3-10. A total of 114.56 ~~112.57~~ acres of wetlands, 2.15 acres of high tide refugia, and 7.70 ~~11.85~~ acres of upland ~~transitional habitat or berm~~ will be provided per Table 4.3-10. Unlike Alternative B, the Otay River Floodplain Site would be recontoured to include a subtidal channel encompassing about 4.5 acres of the site. The Pond 15 Site would also be recontoured to create similar, deeper tidally influenced subtidal and coastal salt marsh zones.
Wildlife and Fisheries	No change from the existing condition.	Currently, available habitat for wintering waterfowl and migrant and wintering shorebirds on the Otay River Floodplain Site is limited. Small patches of disturbed wetland communities, including southern coastal salt marsh, remain on approximately 1.26 acres of the site, and *Isocoma* scrub, an upland habitat, provides foraging and nesting areas for a variety of upland species. The proposed restoration activities at the Otay	Impacts would be similar to those identified for Alternative B.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
		River Floodplain Site would represent a direct loss of 27.96 ~~18.40~~ acres of potential upland and 6.43 acres of conversion of wetland foraging and nesting habitat. This loss would displace some existing species (e.g., upland bird species, reptiles, mammals), while expanding the available habitat for other species (e.g., migratory shorebirds and seabirds, waterbirds, fish, and benthic invertebrates). The loss of upland habitat in this area is offset by the proposal to establish native upland vegetation to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality. Currently, the Pond 15 Site provides foraging, loafing, and rafting habitat for wintering waterfowl, migratory and wintering shorebirds, migratory seabirds, and other year-round waterbirds and summer visitors. Although the number of birds within the salt pond can be high, species richness is low, especially compared to the adjacent San Diego Bay. Once the Pond 15 Site is connected to San Diego Bay and the area is subject to tidal influence, the habitat quality would increase and new foraging opportunities would develop over time, providing a net benefit to a wide range of bird species. As a result, implementation of Alternative B would not result in any significant direct impacts to nesting birds in or adjacent to the Pond 15 Site.	
Endangered and Threatened Species and Other Species of Concern	No change from the existing condition.	The proposed restoration activities at the Otay River Floodplain Site would result in direct, construction-related impacts to special-status plant species and their habitats. The proposed restoration activities at the Otay River Floodplain Site would result in direct impacts to 1.26 acres of native southern coastal salt marsh habitat that is occupied by the State-listed threatened Belding's Savannah sparrow. The proposed restoration would include planting of the special-status plant species to replace those individuals impacted. Under Alternative B, existing habitats in the 33.51-acre Otay River Floodplain Site and the 90.90-acre Pond 15 Site would be converted to tidally influenced coastal wetland habitat (i.e., low, mid, and high salt marsh) and associated transitional and seabird nesting habitat. This restoration would provide suitable foraging and nesting habitat for threatened and endangered	Impacts would be similar to those identified for Alternative B.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
		species, including salt marsh habitat to support light-footed Ridgway's rail and Belding's Savannah sparrow, and transitional habitat to support foraging for San Diego black-tailed jackrabbit, short-eared owl, burrowing owl, merlin, and white-tailed kite, and mudflat areas to potentially support western snowy plover. Restoration of the Otay River Floodplain Site to intertidal and transitional habitats would provide benefits to the San Diego Bay ecosystem and to the special-status species known to occur or that have the potential to occur in wetland areas surrounding south San Diego Bay. Mitigation measures, including halting construction during the nesting season, have been incorporated into the scope of the project to minimize the potential for impacts to sensitive species.	
Cultural Resources			
Historical Resources	No change from the existing condition.	With implementation of MM-CUL-1 and MM-CUL-2, no significant impacts to historical resources are anticipated. MM-CUL-1 would require the signing of a Memorandum of Agreement by the U.S. Fish and Wildlife Service (Service) and the State Historic Preservation Office that would require supplemental photodocumentation for Ponds 13, 14, and 15 and the northern portion of Pond 20A; oral history research; history of the salt works posted on the Service site; and an interpretive panel that expands on the interpretation already developed to inform visitors of the historic significance of the salt works. MM-CUL-2 would ensure protection of historic rail tracks in the vicinity of Pond 15.	Impacts would be similar to those identified for Alternative B.
Cultural Resources	No change from the existing condition.	With implementation of MM-CUL-1 and MM-CUL-3 through MM-CUL-5, no significant impacts to cultural resources are anticipated. A qualified archaeologist meeting the *Secretary of the Interior's Standards and Guidelines: Professional Qualifications Standards* and a qualified Kumeyaay cultural monitor would monitor all grading and subsurface disturbance within the proposed action's area of potential effect. If cultural resources are encountered during excavation, appropriate actions per Federal regulations would be implemented to avoid the potential for significant adverse effects to cultural resources.	Impacts would be similar to those identified for Alternative B ~~with implementation of MM-CUL-1~~.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
Social and Economic Environment			
Land Use	No change from the existing condition.	The proposed restoration would not be considered incompatible with nor would it result in adverse effects to surrounding land uses.	Impacts would be similar to those identified for Alternative B.
Traffic, Circulation, and Parking	No change from the existing condition.	Implementation of this alternative would require 56,000 one-way ~~43,000~~ truck haul trips between the Otay River Floodplain Site and the Pond 15 Site. With implementation of MM-TRA-1 and MM-TRA-2, the construction trips associated with this alternative would not exceed existing roadway volume-to-capacity ratios as established by the affected jurisdictions, exceed road or intersection capacities, or substantially alter the demand for on- and/or off-street parking spaces.	An additional 54,000 cubic yards of soil would be transported from the Otay River Floodplain Site to the Pond 15 Site, resulting in 67,100 one-way~~52,000~~ truck trips under the truck soil transport option. With implementation of MM-TRA-1 and MM-TRA-2, even with these additional trips, no significant impacts are anticipated on area roadways due to increased construction-related traffic.
Public Utilities/Easements	No change from the existing condition.	A number of public utilities and utility easements occur to the east of the proposed restoration site in the Otay River floodplain, while no utilities are located near the Pond 15 Site. To ensure that construction activities associated with the implementation of Alternative B do not interfere with or damage existing utilities in the Otay River Floodplain, the Service would coordinate with individual utility agencies prior to completion of the final construction plans. Based on this coordination, all actions deemed necessary to protect existing utilities would be included in the final construction plans.	Impacts would be similar to those identified for Alternative B.
Vectors and Odors	No change from the existing condition.	The proposed wetlands within the Otay River Floodplain Site and Pond 15 Site under Alternative B have been designed to avoid the creation of mosquito breeding habitat. No impacts related to odors are anticipated.	Impacts would be similar to those identified for Alternative B.
Economics and Employment	No change from the existing condition.	The Pond 15 Site is currently part of an active solar salt operation, one of the three primary evaporation ponds managed ~~currently in use~~ by the South Bay Salt Works. Under Alternative B, restoration of the Pond 15 Site would reduce the current number of ponds in the solar salt operation, potentially reducing the annual revenues for the operation. These potential impacts have been planned and are addressed in the Comprehensive Conservation Plan for the San Diego Bay National Wildlife Refuge. The impacts are not considered significant. As a multi-million dollar construction project, Alternative B would provide temporary	Impacts would be similar to those identified for Alternative B.

Table 5-1
Summary of Potentially Significant Impacts of Alternatives

Resource Area	Alternative A	Alternative B	Alternative C
		employment opportunities. To avoid impacts to the operation of the salt works during construction, early coordination with the South Bay Salt Works, per MM-ECO-1, is required.	
Environmental Justice	No change from the existing condition.	Any potential impacts related to this alternative would not disproportionately affect any racial, ethnic, or socioeconomic group.	Impacts would be similar to those identified for Alternative B.
Growth Inducement	No change from the existing condition.	This alternative would have no effect on growth in the region because it would not create any permanent employment opportunities or accommodate or influence the need for additional housing in the region.	Impacts would be similar to those identified for Alternative B.
Hazards and Hazardous Material	No change from the existing condition.	If hazardous materials are present, they would be stored and handled in accordance with all Federal, State, and local regulations. Additionally, standard best management practices (BMPs) would be applied to ensure that accidental release or spills of hazardous materials are avoided. No significant impacts are anticipated.	Impacts would be similar to those identified for Alternative B.
Energy	No change from the existing condition.	This alternative would not require any additional regional energy supplies.	Impacts would be similar to those identified for Alternative B.

CHAPTER 6
OTHER SECTIONS REQUIRED BY NEPA AND/OR CEQA

6.1 ADDITIONAL ANALYSIS REQUIRED BY NEPA

6.1.1 Unavoidable Significant Impacts

As outlined in detail in Chapter 5, Comparison of Evaluated Alternatives, of this Environmental Impact Statement (EIS), no unavoidable significant environmental impacts are anticipated as a result of implementation of any of the three proposed alternatives. Where the potential for such impacts has been identified, appropriate mitigation measures have been incorporated into the scope to reduce those impacts to below a level of significance.

6.1.2 Irreversible and Irretrievable Commitments of Resources

Irretrievable commitments to the consumption of fossil fuels would result from construction of the proposed action; however, this commitment would be substantially reduced after site preparation is completed. The restoration of coastal wetlands at the Otay River Floodplain Site would also represent an irreversible commitment of upland habitat; however, the affected uplands are the result of historical filling of natural wetland areas.

The commitment of funds to the proposed action would be irreversible, and those funds would be irretrievable. However, the proposed action is a requirement of the California Coastal Commission's Coastal Development Permit (CDP No. E-06-013), which allows Poseidon to construct and operate a desalination facility in the City of Carlsbad, San Diego County, California (for more information, refer to Section 1.3, Project Background). Therefore, funds for the proposed action were committed as a result of the approval of the desalination facility in the City of Carlsbad and the Marine Life Mitigation Plan.

6.1.3 Short-Term Uses versus Long-Term Productivity

All of the restoration alternatives proposed would ensure the long-term productivity and integrity of the biological resources on the project site. All alternatives proposed would displace solar salt production within the Pond 15 Site, which would decrease salt productivity and the total density of brine invertebrates available within the current system in the area. Restoration of the Otay River Floodplain Site would not interrupt any current use of the site. Restoration of both wetlands would increase long-term biological diversity in the area through the reintroduction of tidal circulation, which would allow the project site to support coastal marsh habitat and the species that depend on this habitat for foraging and breeding.

6.2 ADDITIONAL ANALYSIS REQUIRED BY CEQA

The following sections are included for the Regional Water Quality Control Board and California Coastal Commission, and potentially for the Port of San Diego to make the appropriate California Environmental Quality Act (CEQA) findings or equivalency findings, as described in Section 1.5.5, California Environmental Quality Act, of this EIS.

6.3 GROWTH INDUCEMENT

CEQA requires a discussion of the growth-inducing impact of a proposed project. CEQA Guidelines Section 15126.2(d) states that a project would be growth inducing if it fosters economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment (14 CCR 15126.2(d)). This designation includes projects that would remove obstacles to population growth, such as the major expansion of utility lines. Additionally, projects that would require a significant labor force and/or new employees for proposed construction, commercial or industrial development, or residential development represent forms of potential growth. These direct forms of growth have secondary impacts of expanding the size of local markets and attracting additional economic activity to an area. Under CEQA, growth inducement is not perceived as a beneficial impact, detrimental impact, or of little significance to the environment. Typically, the growth-inducing potential of a project would be considered significant if it would stimulate human population growth or a population concentration above what is assumed in local and regional land use plans, or in projections made by regional planning authorities. Significant growth impacts could also occur if a project would provide infrastructure or service capacity to accommodate growth beyond that permitted by local or regional plans and policies.

Both of the action alternatives for the Otay River Estuary Restoration Project (proposed action) would restore tidally influenced habitat in the San Diego Bay National Wildlife Refuge. The action alternatives would not result in housing, utility expansion, or significant employment opportunities. Neither action alternative would create employment opportunities after construction is complete, and construction would not require an increase in the labor force in the area. No barriers to growth would be reduced, and implementation of either action alternative would not allow for population growth, either directly or indirectly.

The proposed action is a partnership between the U.S. Fish and Wildlife Service and Poseidon to fulfill the applicable terms and conditions of the permits issued to Poseidon by the California Coastal Commission and Regional Water Quality Control Board for the Carlsbad Desalination Plant. Specifically, the proposed action alternatives outlined in this EIS serve as the required restoration associated with the Marine Life Mitigation Plan for the Carlsbad Desalination Plant, outlined in detail in Section 1.3 of this EIS. Therefore, implementation of the action alternatives outlined in this EIS would facilitate implementation of the Carlsbad Desalination Plant.

Although the restoration proposed in this EIS would not reduce barriers to growth or facilitate growth inducement, the Carlsbad Desalination Plant would provide approximately 50 million gallons a day of reverse osmosis water for the local water supply. A Final Environmental Impact Report (EIR) was prepared to address all associated impacts of implementation of the Carlsbad Desalination Plant (Dudek 2005). As outlined in further detail within that EIR, growth-limiting factors in San Diego County are primarily related to availability of buildable land and adequate infrastructure to support growth in new areas. Therefore, there is not a linear relationship between water availability and growth.

No growth inducement is anticipated through implementation of the action alternatives presented in this EIS.

6.4 HAZARDS

Alternative A would not require the transport, use, or disposal of hazardous materials, as no action is proposed under that alternative. Alternative B and Alternative C may require transport of hazardous materials, such as common solvents, during construction. If hazardous materials are present, they would be stored and handled in accordance with all Federal, State, and local regulations. Additionally, standard best management practices (BMPs) and the implementation of MM-HYD-3 would be applied to help ensure that accidental releases or spills of hazardous materials are avoided. A spill plan would be prepared to ensure appropriate actions should a spill occur, and spill kits would be available to allow for quick response times in the event of a spill. The project site 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.

As described in Section 3.2.2, Geology, Soils, and Agricultural Resources, of this EIS, the Otay River Floodplain Site is at risk for liquefaction and settlement due to existing soils and groundwater in the area, and the Pond 15 Site is at risk for inundation should an offshore earthquake cause a tsunami. However, the action alternatives do not propose structures, and would not expose people to a significant risk of loss, injury, or death. Also, the project site is not located within 0.25 miles of a school facility, or within 2 miles of a public airport, public use airport, or private airstrip. The restoration associated with implementation of the proposed action would not alter the land use on site and therefore would not impair implementation of an adopted emergency evacuation plan. No significant impacts are anticipated related to hazards.

6.5 ENERGY

Energy consumption associated with implementation of Alternative A would be limited to fuel and office energy costs associated with site monitoring, maintenance, and reporting.

Of the ~~three~~ two potential transfer methods, the trucking haul method of transferring material between the Otay River Floodplain Site and the Pond 15 Site would require the most fuel for implementation of the proposed action. Alternative B would result in the use of approximately 168,860 gallons of fossil fuel, and Alternative C would result in approximately 206,300 gallons of fossil fuel over the course of construction. Additional fuel may be expended following construction when plants are installed within the prepared wetlands. This level of fuel consumption is relatively low compared to the total annual fuel consumption in the region. Once site preparation and planning have been completed, energy consumption would be only slightly higher than levels currently associated with site maintenance and monitoring. This slight increase is attributed to more comprehensive monitoring of the site to ensure compliance with associated permits required for implementation of the proposed action. Due to the relatively low levels of energy consumption from truck trips and mowing associated with site maintenance over the life of the proposed action, no significant impacts associated with energy use are anticipated from implementation of the proposed action.

CHAPTER 7
COMPLIANCE, CONSULTATION, AND COORDINATION WITH OTHERS

7.1 COMPLIANCE WITH APPLICABLE FEDERAL LAWS, REGULATIONS, EXECUTIVE ORDERS, AND OTHER GUIDANCE

In undertaking the Otay River Estuary Restoration Project (ORERP or proposed action), the U.S. Fish and Wildlife Service (Service) must comply with all applicable Federal laws, regulations, executive orders, and other guidance. As stated below, compliance has been or will be accomplished in association with implementation of the proposed action.

Agency Coordination

Executive Order 12372, Intergovernmental Review of Federal Programs

Federal agencies are required to provide opportunities for consultation to all State and local governments that would be directly affected by a Federal action.

Coordination and consultation regarding the proposed restoration is ongoing with State agencies, tribes, other Federal agencies, and local governments that have jurisdiction over one or more aspects of the proposed action, have an interest in the proposed action, or may be affected by activities associated with the proposed action. These entities have been~~will be~~ provided with copies of the Environmental Impact Statement (EIS) for review and comment.

Human Rights Regulations

Executive Order 12898, Environmental Justice

Federal agencies are mandated to achieve environmental justice by identifying and addressing disproportionately high and significant human health or environmental impacts of its programs, policies, and activities on minority and low-income populations.

Environmental justice impacts associated with the proposed action are addressed in Section 4.5.7, Environmental Justice, of this EIS, which states that the various restoration alternatives analyzed for the Otay River Floodplain Site and Pond 15 Site would not cause disproportionately high or significant human health impacts in any population. None of the alternatives would create a greater burden on low-income households.

Cultural Resources Regulations

Compliance with the following Federal laws and executive orders related to cultural resources is outlined in Section 4.4, Cultural Resources, of this EIS.

Executive Order 13007, Indian Sacred Sites

This executive order provides for access to and ceremonial use of Native American sacred sites on Federal land used by Native American or religious practitioners, and directs Federal land managers to avoid significantly affecting the physical integrity of such sacred sites.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

This executive order requires Federal agencies to implement an accountable process to ensure meaningful and timely input by tribal officials as policies are developed that have tribal implications. Federally recognized tribes and other tribal organizations were contacted to solicit comments and initiate consultation with respect to development of this EIS and the alternatives evaluated within this document.

American Indian Religious Freedom Act 1978 (PL 95-341; 92 Stat. 469; 42 U.S.C. 1996)

This act protects and preserves the right of Native Americans to believe, express, and exercise their traditional religions, including access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.

Executive Order 11593, Protection and Enhancement of the Cultural Environment

This executive order requires that if the Service proposes any activities that may affect archaeological or historical sites, the Service will consult with Federal and State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.

Antiquities Act of 1906

This act authorizes the scientific investigation of antiquities on Federal land, prohibits and provides penalties for unauthorized search for or collection of artifacts or other objects of scientific interest, and authorizes the president to establish national monuments and cultural areas on Federal lands.

National Historic Preservation Act of 1966, as amended (PL 89-665; 50 Stat. 915; 16 U.S.C. 470 et seq.; 36 CFR 800)

Federal agencies are directed to take into account the impacts of their actions on items or sites listed or eligible for listing in the National Register of Historic Places (Section 106). Section 110(a) sets inventory, nomination, protection, and preservation responsibilities for Federally owned cultural properties.

Archaeological Resources Protection Act of 1979, as amended (PL 96-95; 93 Stat. 722; 16 U.S.C. 470a(a)–47m(m))

This act protects archaeological resources on public lands.

Native American Graves Protection and Repatriation Act of 1990 (PL 101–601; 25 U.S.C. 3001 et seq.)

Federal agencies are required to provide information about Native American cultural items (e.g., human remains, funerary objects, sacred objects, and objects of cultural patrimony) to parties with standing, such as lineal descendants or culturally affiliated Native American tribes or Native Hawaiian organizations, and, upon presentation of a valid request, dispose of or repatriate these objects to them.

Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79)

Federal agencies are responsible for ensuring proper care of Federally owned and administered archaeological collections, including ensuring that significant prehistoric and historic artifacts and associated records are deposited in an institution with adequate long-term curatorial capabilities. Repositories, whether Federal, State, local, or tribal, must be able to provide professional, systematic, and accountable curatorial services on a long-term basis.

Biological Resources Regulations

National Wildlife Refuge System Improvement Act of 1997

This act, which amends the National Wildlife Refuge System Administration Act of 1966, addresses the administration, management, and planning for National Wildlife Refuges. It ensures that the National Wildlife Refuge System is managed as a national system of related lands, waters, and interests for the protection and conservation of wildlife resources in the United States. The main components of this act are requirements to maintain the biological integrity, diversity, and environmental health of the National Wildlife Refuge System, recognizing that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when determined to be compatible, are legitimate and appropriate public uses of the National Wildlife Refuge System.

Implementation of the proposed action would include objectives presented in the San Diego Bay National Wildlife Refuge (NWR) Comprehensive Conservation Plan (CCP), which was prepared in compliance with this act.

Magnuson-Stevens Fishery Conservation and Management Act

This act is intended to provide conservation and management of fisheries and associated resources. This includes promoting domestic commercial and recreational fishing under sound principles, and promoting the protection of Essential Fish Habitat in the review of projects conducted under Federal permits, licenses, or other authorities that have the potential to affect such habitat. Prior to the approval of any permits for the proposed action from the U.S. Army Corps of Engineers, San Diego Regional Water Quality Control Board, or California Coastal Commission, consultation regarding potential impacts to Essential Fish Habitat would be conducted with the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (Fisheries).

Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)

This act provides for the conservation of ecosystems on which threatened and endangered species of fish, wildlife, and plants depend, both through Federal action and by encouraging the establishment of State programs. Section 7 of the Endangered Species Act requires Federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. Section 7 compliance would occur prior to project implementation.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

This order instructs Federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners in Flight Bird Conservation Plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.

Limitations on when the proposed construction can occur within the San Diego Bay NWR have been imposed in accordance with this executive order, and the proposed restoration is consistent with the goals and objectives of the San Diego Bay NWR CCP, which incorporates the strategies and recommendation of the applicable bird conservation plans.

Executive Order 13113, Invasive Species

Federal agencies whose actions may affect the status of invasive species are required to use relevant programs and authorities to prevent, control, monitor, and research such species, and coordinate complementary, cost-efficient, and effective activities concerning invasive species by relying on existing organizations that address invasive species issues.

The control of invasive exotic weeds would be a required component of the proposed action's habitat maintenance plan.

Migratory Bird Treaty Act of 1918, as amended

This act provides protection for birds that migrate across State and international boundaries.

The Service's Division of Migratory Birds and Habitats Program was consulted during preparation of restoration alternatives, and the actions described in the alternatives proposed for each site were reviewed for consistency with the requirements of the Migratory Bird Treaty Act.

Land and Water Use Regulations

Executive Order No. 13690, Establishing a Federal Flood Risk Management Standard

EO 13690 Revoked

EO 13690 revised Executive Order 11988 (Floodplain Management) and proposed a new Federal Flood Risk Management Standard (FFRMS). The EO states that "It is the policy of the United States to improve the resilience of communities and Federal assets against the impacts of flooding. These impacts are anticipated to increase over time due to the effects of climate change and other threats. Losses caused by flooding affect the environment, our economic prosperity, and public health and safety, each of which affects our national security. The Federal Government must take action, informed by the best-available and actionable science, to improve the Nation's preparedness and resilience against flooding." As a result of this EO, a new flood risk reduction standard for federally funded projects was developed. The Federal Flood Risk Management Standard (Standard) is a flexible framework to increase resilience against flooding and help preserve the natural values of floodplains. Incorporating this Standard will ensure that agencies expand management from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended.

~~Executive Order 11988, Floodplain Management~~

~~In accordance with Executive Order 11988, Floodplain Management, Federal agencies are prohibited from contributing to the "significant impacts associated with the occupancy and modification of floodplains" and the "direct or indirect support of floodplain development." In addition, before proposing, conducting, supporting, or allowing an action in a floodplain, each agency is to determine whether planned activities will affect the floodplain and evaluate the potential impacts of the intended actions on floodplain functions.~~

The potential impacts of restoring wetlands within the Otay River Floodplain Site on properties located upstream and downstream of the project site are evaluated in Sections 4.2.1, Topography/Visual Quality, 4.2.2, Geology and Soils and 4.2.5, Hydrology and Water Quality, of this EIS. The effects of sea-level rise were considered in these analyses, and measures have been incorporated into the scope of the proposed action to ensure that no significant impacts related to flooding would result from project ~~associated with~~ implementation. ~~of the action alternatives would occur.~~

Executive Order 11990, Protection of Wetlands

This executive order states that each agency must provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when conducting Federal activities and programs affecting land use, including water and related land resources planning, regulating, and licensing activities.

Each of the action alternatives described in this EIS includes proposals to improve and/or restore current wetland habitat on the project site while avoiding negative impacts to the current wetland areas within the South San Diego Bay Unit of the San Diego Bay NWR.

Coastal Zone Management Act of 1972 (16 U.S.C. 1451–1646)

This act requires that all Federal actions proposed in the coastal zone be conducted in a manner consistent with the approved coastal zone management plan. A CDP from the California Coastal Commission (Commission) must be issued for the portion of the proposed action to occur on the San Diego Bay NWR before construction can begin, and a CDP from the Port of San Diego must be issued for excavation within the Port's jurisdiction that will occur in association with breaching Pond 15.

Federal Water Pollution Control Act of 1948, as amended (33 U.S.C. 1251–1376; Chapter 758; PL 845; 62 Stat. 1155) (Clean Water Act)

This act establishes the basic structure for regulating discharges of pollutants into waters of the United States. Section 402 of the act established the National Pollutant Discharge Elimination System program to authorize the U.S. Environmental Protection Agency's issuance of discharge permits (33 U.S.C. 1342), and Section 404 authorized the U.S. Army Corps of Engineers (Corps) to issue permits for the discharge of dredged or fill material into navigable waters at specified disposal sites (33 U.S.C. 1344).

Prior to implementation of the proposed wetland restoration, the appropriate permits related to the Clean Water Act would be obtained. Best management practices (BMPs) would be implemented during restoration to avoid or minimize the potential for significant impacts to water quality to the San Diego Bay and adjacent wetlands.

7.2 REQUIRED PERMITS OR APPROVALS

Biological Resources

Compliance with Section 7 of the Endangered Species Act will occur prior to implementation of any proposed action. The Service will consult with NOAA Fisheries due to the presence of the threatened East Pacific green sea turtle (*Chelonia mydas*) in the vicinity of the project site. In addition, the Service will conduct an Intra-Service consultation to consider potential effects of the Service's actions on the listed species addressed in Section 3.3.3 of this EIS.

Water Resources and Water Quality

In accordance with the Clean Water Act, prior to project implementation, a Section 401 Certification will be obtained from the San Diego Regional Water Quality Control Board demonstrating that any discharges into waters of the United States will comply with all applicable water quality standards, limitations, and restrictions. Once this certification has been granted, a Nationwide Permit 27, processed in accordance with Clean Water Act Section 404 Permit and a Rivers and Harbors Act Section 10 Permit, will be obtained from the U.S. Army Corps of Engineers to permit the proposed activities to occur within jurisdictional waters of the United States.

Coastal Resources

Because the proposed action is occurring in part as mitigation for the Carlsbad Desalination Plant and a portion of the proposed action is located in an area covered by the Local Coastal Program for the Port of San Diego, the project must be implemented in conformance with California Coastal Act. In addition, the majority of the project will occur on federal land; therefore, the project must also be found consistent with the Coastal Zone Management Act.

On November 15, 2007, the Commission approved a CDP (No. E-06-013) for Poseidon to construct and operate a desalination facility in Carlsbad, California. As a part of Special Condition 8 of this approval, the Commission required Poseidon to prepare and submit a Marine Life Mitigation Plan (MLMP) to address the potential impacts caused by the Carlsbad Desalination Plant's use of estuarine water and its entrainment of marine organisms. This MLMP was finalized on November 21, 2008, with incorporations and revisions from the Commission (Poseidon 2008).

The MLMP required Poseidon to submit a proposed mitigation site and restoration plan, which led to development of the proposed action. A determination from the Commission that the proposed action is consistent with the requirements, objectives, and restrictions of the MLMP is required.

The Commission required an application for a CDP be submitted for the proposed action in May 2014. A staff report and findings related to the CDP application for the proposed action will serve as the CEQA-equivalent environmental analysis document prepared under the Commission's certified regulatory program.

The restoration of Pond 15 requires dredging of a 0.79-acre portion of Port land located immediately to the north of the Pond 15 levee. The need to remove approximately 4,300 cubic yards of material within the Port's jurisdiction to facilitate tidal exchange within the pond requires the approval of a CDP from the Port for that specific action.

Air Quality

In accordance with Rule 1501 (Conformity of General Federal Actions), a conformity determination that the proposed action conforms to the California State Implementation Plan is required for each pollutant where the total direct and indirect emissions in a nonattainment or maintenance areas caused by a Federal action would equal or exceed any of the rates presented in the Rule. However, the requirement for a conformity determination does not apply to actions where the total direct and indirect emissions are below the emissions levels in paragraph (b) of the Rule. Based on the analysis presented in Section 4.2.6.1 of this EIS, project implementation would not result in emissions equal to or in excess of the rates presented in Rule 1501, therefore, no conformity determination is required.

Other Permits or Approvals

If aspects of the proposed action are altered, such as staging, stockpiling, or haul trips, and as a result, impacts occur within the City of San Diego's permitting jurisdiction, additional permits or approvals may be required.

7.3 CONSULTATION AND COORDINATION WITH OTHERS

7.3.1 Public Outreach

The following summarizes the public outreach that occurred for this EIS, including the initial scoping meetings, interagency meetings, restoration update mailings, Federal Register notices, and an overview of the topics discussed or comments received. For the 2011 Scoping Meetings, the EIS distribution list and a summary of the public comments provided during initial scoping are provided in Appendix B~~A~~. For the 2013 Scoping Meeting, the EIS distribution list and summary of comments provided are also provided in Appendix B.

7.3.1.1 Initial Scoping Meetings

2011 Scoping Meetings

Date and Location of the Meetings: December 6, 2011, at the Swiss Park & Club, 2001 Main Street, Chula Vista, California 91911 (two separate meetings, at 1 p.m. and 6 p.m.).

Notification Process: Project packets distributed, including a project description, notice of scoping meetings, proposed action schedule, and comment information.

Purpose: To inform the public/receive public comments.

Format: A presentation describing the proposed action, purpose and need, and objectives and a tour of the project site.

Number of Participants: A total of 22 people between the two meetings.

2013 Scoping Meeting

Date and Location of the Meeting: January 23, 2013, at the Swiss Park & Club, 2001 Main Street, Chula Vista, California 91911.

Notification Process: Restoration plan update distributed, including a project description, notice of scoping meetings, proposed action schedule, and comment information.

Purpose: To inform the public and receive public comments.

Format: A presentation describing updates to the proposed action, purpose and need, and objectives.

Number of Participants: Fourteen people.

7.3.1.2 Proposed Action Updates

Date: November 2011.

Purpose: To inform the public of the proposed action's details, provide notice of additional scoping meeting, update EIS schedule, request public comments, and provide contact information.

Date: January 2013.

Purpose: To inform the public of updates on the proposed action's details, provide notice of additional scoping meeting, update EIS schedule, request public comments, and provide contact information.

7.3.1.3 Federal Register Notices

2011 Federal Register, 76 FR 70480

Date of Notice: November 14, 2011.

Purpose: Notice of Intent to prepare an EIS and request public comment.

Contents of the Notice: The notice includes a project summary, background on the proposed action, project description, request for public comment, and contact information.

2013 Federal Register, 78 FR 1246

Date of Notice: January 8, 2013.

Purpose: Notice of Intent to prepare an EIS and request public comment.

Contents of the Notice: The notice includes a project summary, background on the proposed action, project description, request for public comment, and contact information.

2016 Federal Register, 81 FR 72817

Date of Notice: October 21, 2016.

Purpose: Notice of Availability and request for public comment for the Draft EIS.

Contents of the Notice: The notice announced the availability of the draft EIS for public review and comment, with comments due by December 5, 2016. The comment period was extended to December 30, 2016 per 81 FR 95176.

2016 Federal Register, 81 FR 72803

Date of Notice: October 21, 2016.

Purpose: Environmental Impact Statements; Notice of Availability.

Contents of the Notice: The Environmental Protection Agency (EPA), pursuant to Section 309(a) of the Clean Air Act, provided notice of where the EPA's comments on EISs issued by other agencies that were filed with the EPA between October 10, 2016 and October 14, 2016 can be found. The notice also listed the Draft EISs, provided contact information for each, and indicated when the comment period for each document, including the ORERP Draft EIS, would end.

7.3.1.4 Other Public Outreach

A Restoration Update (provided in Appendix B) was issued by the Service to announce the availability of the Draft EIS and the public meeting that was held on November 7, 2016 to take verbal comments. The Restoration Update, which also summarized the alternatives and provided information regarding how and where to submit comments, was mailed out to over 330 individuals, organizations, tribes, and public agencies. A Notice of Completion was sent to the State Clearinghouse on October 14, 2016 and a Notice of Availability was published in the legal section of the Union Tribune on October 21, 2016 (both provided in Attachment B). The public comment period for the DEIS began on October 21, 2016 and ended on Dec 30, 2016. Comments received during the public review period and the associated responses are provided as Appendix A of this FEIS.

7.3.2 Agency Coordination

The Corps is participating in the review, analysis, and preparation of this EIS as a cooperating agency. Coordination and consultation is ongoing with other Federal and State agencies, tribes, and the local governments that surround the San Diego Bay NWR. These entities were also provided with copies of the Draft EIS for review and comment.

Consultation with NOAA Fisheries is required by the Federal Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act. Coordination with NOAA Fisheries about the potential action alternatives' impacts on Essential Fish Habitat and the East Pacific green sea turtle will also occur prior to project initiation.

Scientific Advisory Panel

The Scientific Advisory Panel (SAP) is a combination of Federal, regional, and local agencies formed to provide a technical perspective on location, design, and implementation of the proposed action. The SAP is a collaboration of representatives from the Regional Board, California Department of Fish and Wildlife, Commission, Corps, and Carlsbad Fish and Wildlife Office. Depending on the stage of the process, the SAP has held either weekly or monthly meetings to ensure early collaboration between these agencies.

The SAP was formed to provide scientific expertise to the MLMP workgroup, which includes a collaboration of the Commission and representatives from several other State and Federal agencies. The MLMP workgroup, a separate entity from the SAP, was tasked to develop restoration alternatives to comply with the MLMP required by Special Condition 8 of the permit allowing Poseidon to construct and operate a desalination facility in Carlsbad, California.

7.4 TRIBAL CONSULTATION/COORDINATION

Title 36 of the Code of Federal Regulations, Part 800, implements Section 106 of the National Historic Preservation Act. This defines the necessary consultation with f~~F~~ederally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be significantly affected by a proposed undertaking; and to outline the process for eliminating, reducing, or mitigating significant impacts. In accordance with the National Environment Policy Act, National Historic Preservation Act, and Native American Graves Protection and Repatriation Act, the Service conducted consultations with several tribes, as outlined in Table 7-1. Tribal consultation will be ongoing throughout the proposed action timeline, and responses received to date included a request that a qualified tribal member monitor the archaeological survey and testing activities. In addition, a request was made that archaeologists and cultural monitors be on site to monitor construction activities. Cultural monitors have specialized knowledge of cultural practices and physical objects particular to the project site.

Table 7-1
NRHP Eligibility Status for Cultural Resources within the Project Area

Date	Policy	Purpose
—	NEPA	Notice of Intent
July 11, 2012	NHPA	Undertaking and Area of Potential Impacts
April 3, 2013	NAGPRA	Inadvertent Discovery
June 5, 2013	NAGPRA	Notice of Intended Disposition
—	NEPA and NHPA	Pre-Project Consultation

NRHP = National Register of Historic Places; NEPA = National Environment Policy Act; NHPA = National Historic Preservation Act; NAGPRA = Native American Graves Protection and Repatriation Act.

Positively identified human remains were located during subsurface testing on site. The Service initiated Native American consultation efforts to determine further actions. On July 24, 2013, all human remains were repatriated to the Most Likely Descendant on the Kumeyaay Cultural Repatriation Committee. Details of this process are included in the Otay River Estuary Restoration Project Cultural Resources Evaluation prepared by Dudek in 2014, included as Appendix K of this EIS.

CHAPTER 8
REFERENCES CITED

1 INTRODUCTION

71 FR 64552–64553. Notice of availability of record of decision; "Record of Decision for the Final Comprehensive Conservation Plan and Environmental Impact Statement for the San Diego Bay National Wildlife Refuge (Sweetwater Marsh and South San Diego Bay Units). November 2, 2006.

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CHAPTER 9
LIST OF PREPARERS

United States Fish and Wildlife Service

Brian Collins, Refuge Manager
Patricia Roberson, Regional NEPA Coordinator
Carol Roberts, Environmental Contaminants Program
Victoria Touchstone, Refuge Planner
Andrew Yuen, Project Leader
Katie Zeeman, Environmental Contaminants Program

Poseidon

Stan Williams, Vice President

Dudek

Joe Monaco, AICP, Principal in Charge
Brian Grover, AICP, Senior Project Manager
Katherine Godfrey, Environmental Planner
Jennifer Sucha, AICP, Environmental Planner
Alexandra Martini, Environmental Planner
Lesley Terry, GIS Analyst/CAD Technician
Anita Hayworth, Senior Biologist
Becky Golden-Harrell, Publications Group Leader
Laurel Porter, Technical Editor
Anne McDonnell, Technical Editor
Devin Brookhart, Publications Specialist Lead
Taylor Eaton, Publications Specialist
David Mueller, Publications Specialist
Micah Hale, PhD, RPA, Senior Project Manager/Archaeologist
Adam Giacinto, MA, RPA, Archaeologist
Brad Comeau, MSc, RPA, Associate Archaeologist
Samantha Murray, MA, RPA, Archaeologist & Architectural Historian

Dr. Scott A. Jenkins Consulting

Scott A. Jenkins, PhD
Joseph Wasyl

Everest International Consultants Inc.

David Cannon

WRA Inc.

Michael Josselyn, Principal

Nordby Biological Consulting

Chris Nordby, Owner and Principal

KTU+A

Mark Carpenter, Senior Associate